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The AFRL Auroral Boundary Algorithm

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14. ABSTRACT
The AFRL algorithm obtains equatorward boundaries of auroral precipitation from electron fluxes measured by SSJ sensors on DMSP satellites. Gussenhoven and co-workers provided the empirical basis for the algorithm, showing that auroral boundaries correlate linearly with the Kp geomagnetic index. This report describes (a) the DMSP database, (b) derived statistical parameters, (c) tests performed on these statistics, and (d) the utility of test results. We illustrate the algorithm's method of operation through four detailed boundary identifications obtained during a full orbit of DMSP satellite F16 on 25 July 2004.

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AFRL AURORAL BOUNDARY ALGORITHM

1. SUMMARY

The equatorward auroral boundary location is determined from the AFRL algorithm using electron flux data obtained with the SSJ5 sensor onboard DMSP satellites. This report presents the data used for determination, describes the operation of the algorithm, and describes in detail the method of determination of the four equatorward auroral boundaries for orbit 9 of DMSP satellite F16, 25 July 2004 (Julian day 207). Results are presented numerically and also as spectral views of these boundary locations in time and in magnetic latitude.

2. INTRODUCTION

The dynamics of the auroral oval negatively impact the operations of Air Force communications and surveillance systems at high magnetic latitudes. Research aimed at understanding the vagaries of these space weather effects on system performance led to the development of new methods to specify and predict the location and intensity of auroral optical-emission and plasma distributions. By the early 1970s auroral scientists recognized that the nightside auroral oval magnetically maps to the magnetospheric plasma sheet. Electrons and ions with energies in the kilo-electron Volts (keV) range in the plasma sheet precipitate into the high-latitude ionosphere to create optical emissions and new ionospheric plasma.

Using auroral electron flux measurements by the particle spectrometer on the Defense Meteorological Satellite Program (DMSP) satellites F2 and F4, *Gussenhoven et al.* [1980, 1981] demonstrated that the location of the equatorward boundary of the auroral oval linearly correlates with the Kp geomagnetic index. The prevailing linear relationships vary from one magnetic local time sector to the next. Gussenhoven and coworkers at AFRL developed automatic techniques to recognize the location of auroral boundaries from variations in the data streams of the SSJ sensors that fly on DMSP satellites, [*Hardy et al.*, 1984]. The algorithm's utility is

limited by the fact that boundary identifications are observed only along the spacecraft's trajectory. Boundary extensions to other magnetic local times derive from statistical inference.

DMSP F16 was launched in October 2003 carrying the Special Sensor Ultraviolet Spectrographic Imager (SSUSI). In principle the SSUSI imager offers the possibility of extending in local time our instantaneous knowledge of the auroral boundary location via direct UV measurements. To validate SSUSI's ability to identify auroral boundaries, we compared its measurements with those by the SSJ5 sensor on DMSP F16. In support of this effort we deemed it useful to write a detailed description of the AFRL algorithm for identifying auroral boundaries.

The AFRL Auroral Boundary Algorithm provides automatic identification of the equatorward boundary of the auroral oval. This report describes (a) the database used; (b) the statistical parameters generated from the database; (c) the actual tests performed on these statistics; (d) the use of these test results. Collectively, these details constitute the operation of the algorithm which results in the equatorward auroral boundary determination. The specific database provides for determination of 4 boundaries in each orbit of 6060 seconds. Boundaries for one complete orbit are shown as they are generated, together with the database, statistical parameters, tests results, and description and display of final boundary determination. These boundaries are shown also graphically as spectral images in both compressed-time and expanded-time views.

3. THE DATABASE

The database used in this description results from data recorded by the SSJ5 sensor onboard the DMSP Satellite F16, during orbit 9 of the satellite on 25 July 2004 (Julian Day 207). The specific data used for boundary determination are electron counts as recorded in 20 discrete energy bins of the J sensor. The calculations are performed by considering significant changes in slope of electron count-rate (counts/observation) spectra, a process dominated by data acquired in high-energy channels.

4. THE SENSOR

The J sensor stores electron counts in 20 assigned energy channels, E_1 through E_{20}, where the high-energy channels are $E_1 = 30\text{keV}$, $E_2 = 20\text{keV}$, $E_3 = 14.4\text{keV}$, ..., $E_{10} = 1\text{keV}$, and the low-energy channels are $E_{11} = 1\text{keV}, \ldots, E_{20} = 30\text{eV}$. The electron counts, e_i ($i = 1\ldots20$), in channel E_i are summed every 4 seconds. Times assigned to the sums are those of the start of each 4-sec interval. There are 1515 such 4-sec intervals in one orbit of ~102 minutes, and 14 orbits/day. The counts are summed in pairs, n_i, ($i = 1\ldots10$), where $n_1 = e_1 + e_2$, $n_2 = e_3 + e_4, \ldots, n_{10} = e_{19} + e_{20}$. For DMSP satellites designated F16 and higher there is no channel E_{11}. Consequently, in summing the counts, since $n_6 = e_{11} + e_{12}$, e_{11} has been set equal to e_{12}.

5. THE SATELLITE ORBIT

The DMSP satellite orbit is considered as starting at the equator in the Evening Sector (see Figure 1a). As the satellite moves from equator to pole (poleward), the equatorward edge of the auroral boundary is approached. Data (electron counts) are run, as collected, through the algorithm in quadrant 1 (Quad 1) and quadrant 3 (Quad 3) (shaded sectors). Conversely, in (Quad 2) and (Quad 4) (white sectors) data are collected as the satellite moves from pole to equator (equatorward). In the white sectors, the sensor encounters auroral activity early in the sector, and exits the equatorward boundary later in the sector as it approaches the equator. Therefore, for such sectors the data are run through the algorithm in order from later-taken to earlier-taken (run backwards in time through the algorithm) as the satellite moves equatorward. In summary, the data are run forward in the shaded sectors, and backwards in the white sectors. Each of the 4 boundary calculations uses 1515 seconds of data, and has an uncertainty of 4 seconds (30 km) for J sensors.

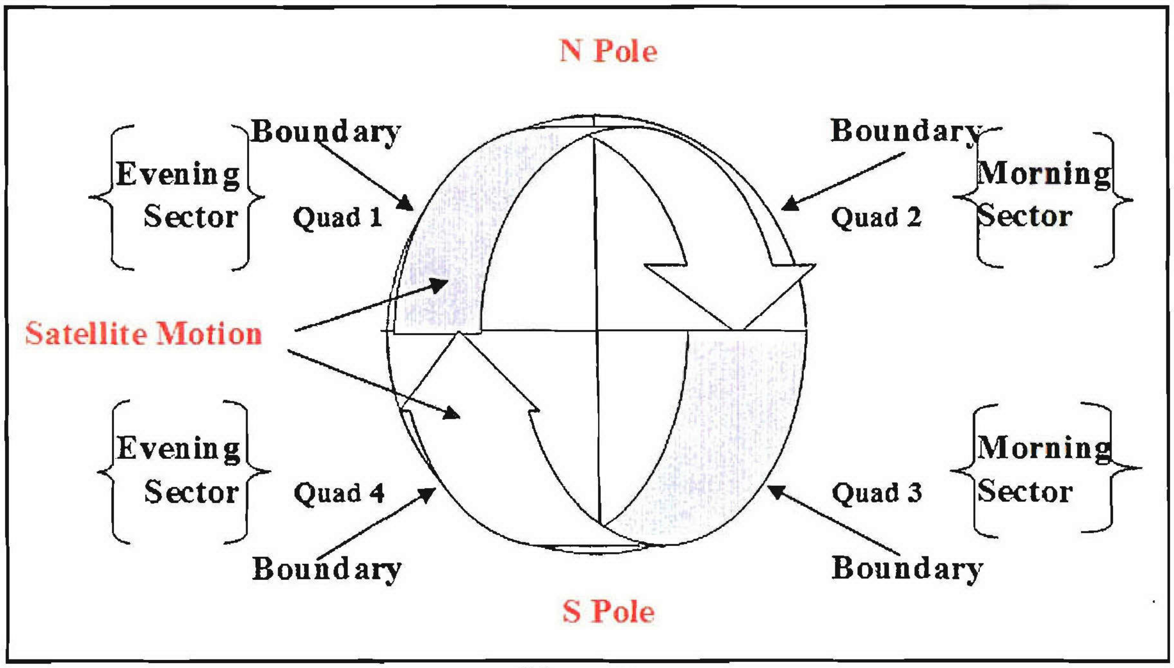

Figure 1a

Satellite Path Showing Morning and Evening Sector Locations

6. STATISTICAL PARAMETERS

The summed counts, n_i, become the basis for generating a set of five statistical parameters S_i, which are controlling factors in the boundary determination (see Statistical Parameter Equations for $S_1 \ldots S_5$ below). Each S_i is tested against a corresponding threshold, h_i, for acceptance or rejection. The thresholds are determined for the J sensor on each satellite during post-launch calibration in the laboratory. In this report, since the data have come from the J5 instrument on DMSP satellite F16, the five thresholds for $h_1 \ldots h_5$ are 350, 28, 20, 25, and 35 respectively. If $S_i > h_i$, then the satellite has probably encountered a boundary. This hypothesis is tested to determine whether or not a boundary was crossed by looking for consistency in exceeding the threshold value, and is then either accepted or rejected on this basis. When all criteria are satisfied the boundary is considered crossed and the boundary search is completed.

Note:

The summed counts, n_i, and the statistical parameters, S_i, together with other parameters constitute the Database for this report, and are shown in Table 2. Due to printer limitations at the time of planning and testing this algorithm, where S_i number sizes become too large to fit on the printed page, **** appears in those locations in this Table. This has no bearing on the boundary determination.

7. STATISTICAL PARAMETER EQUATIONS

S_1 is a function of $n_6 \ldots n_9$ (lower energy channel counts), but the other four, $S_2 \ldots S_5$, are functions of $n_1 \ldots n_5$ (higher energy channel counts) only. The following equations were created and chosen strictly by trial and error at the time of the algorithm development, as adjustments were made to best determine the boundary.

$$S_1 = n_6 + n_7 + n_8 + n_9$$

$$S_2 = \frac{10}{31}\sqrt{\frac{31m_2 - m_1^2}{\frac{m_1}{31}}} \quad \textbf{where} \quad \begin{array}{l} m_1 = 16n_1 + 8n_2 + 4n_3 + 2n_4 + n_5 \\ m_2 = 16n_1^2 + 8n_2^2 + 4n_3^2 + 2n_4^2 + n_5^2 \end{array}$$

$$S_3 = \frac{10}{31}\sqrt{\frac{31m_2 - m_1^2}{\frac{m_1}{31}}} \quad \textbf{where} \quad \begin{array}{l} m_1 = n_1 + 2n_2 + 4n_3 + 8n_4 + 16n_5 \\ m_2 = n_1^2 + 2n_2^2 + 4n_3^2 + 8n_4^2 + 16n_5^2 \end{array}$$

$$S_4 = \frac{10\left|m_1 - m_2\right|}{\sqrt{\max\left(m_1, m_2\right)}} \quad \textbf{where} \quad \begin{array}{l} m_1 = n_1 + n_2 \\ m_2 = n_4 + n_5 \end{array}$$

$$S_5 = 25\sqrt{\frac{5m_2 - m_1^2}{\frac{m_1}{5}}} \quad \textbf{where} \quad \begin{array}{l} m_1 = \sum_{L=1}^{5} n_L \\ m_2 = \sum_{L=1}^{5} n_L^2 \end{array}$$

8. BOUNDARIES AND THEIR DETERMINATION

Boundaries determined from the data recorded by DMSP F16 on 25 July 2004 (Julian day 207) are shown in Table 1 for the entire day. The bordered area encloses four boundaries determined during one full satellite orbit. The values for these boundaries are shown also in Figure 1b below. In Quad 1 of this orbit on the nightside, termed "evening sector" starting at 47613 + 500 sec (48113 sec), a boundary was determined at 48461 sec at 55°.3 Magnetic Latitude, 157°.9 Magnetic Longitude; in Quad 2 on the dayside, termed "morning sector" starting at 49157 + 0 sec (49157 sec), as DMSP moved equatorward from the pole (N), a boundary was determined at 49693 sec at 60°.1 Magnetic Latitude, 359°.2 Magnetic Longitude; in Quad 3, on the dayside, "morning sector" starting at 50673 + 600 sec (51273 sec), as DMSP moved poleward (S) from the equator, a boundary was determined at 51617 sec at -56°.0 Magnetic Latitude, 338°.6 Magnetic Longitude; in Quad 4, on the nightside, "evening sector" starting at 52277 + 0 sec (52277 sec), as DMSP moved equatorward from the pole (S), a boundary was determined at 52833 sec at -57°.0 Magnetic Latitude, 150°.6 Magnetic Longitude.

	Quad 1	Quad 2	Quad 3	Quad 4
	47613 + 500	49157 + 0	50673 + 600	52277 + 0
Orbit Start >>>>>	**48113**	**49157**	**51273**	**52277**
	47613 + 848	49157 + 536	50673 + 944	52277 + 556
Boundary ⟶	**48461**	**49693**	**51617**	**52833**
	49157+ 0	49157 + 996	52277 + 0	52277 + 896
Orbit End >>>>>	**49157**	**50153**	**52277**	**53173**

Figure 1b

Orbit Sector Start Time, End Time, and Boundary Time as Determined for Orbit 9

9. BOUNDARY ANALYSIS

For a boundary determination to occur, there must be significant changes in the slope of the count-rate as indicated by S_i. The data used for the determination of these four boundaries are shown on the Boundary Analysis sheets of Table 2 (21 pages), including n_i and S_i values for every 4-sec interval of the orbit. ***For discussion and illustration of the operation of the algorithm, the boundary determination in Quad 4 (above) will be examined in detail, and revealed by shaded and colored areas on page 31 (Table 2).*** The full set of data and statistics for this boundary determination are shown on pages 30-34 (Table 2).

9.1 Boundary Analysis Table Structure – Quarter Orbits Quad 1 and Quad 3

On page 14, the first page of the Boundary Analysis Table (Table 2), the 25 data columns are labeled $t_1 \ldots t_{25}$. These are 25 4-sec intervals of time for listings of n_i ($i = 1 \ldots 9$). For listing purposes, recording of the start time of this quarter orbit (Quad 1) is shown as 47613 (sec). On the line following, observe the notation "AT T = 500" (sec). Consequently, the time for entry n_1 as shown at t_1 is 47613 + 500; at n_2, is 47613 + 504; n_3, is 47613 + 508, etc across the row of 25 entries – time increasing by 4 sec for each interval. Therefore, time has increased by 100 sec by the start of the data on the lower half of page 14 ("AT T = 600"). This proceeds through page 19 of Table 2, to the end of Quad 1. Recall, from Figure 1a, that data are run forward through the algorithm in Quad 1 and Quad 3 (the shaded sectors). Accordingly, see the data of Quad 3 (Table 2, pages 25-29) and observe that time increases for this quarter orbit as it did for Quad 1.

9.2 Boundary Analysis Table Structure – Quarter Orbits Quad 2 and Quad 4

Data for Quad 2 starts on page 20 of the Boundary Analysis Table (Table 2). For listing purposes, recording of the start time of this quarter orbit is shown as 49157. On the line following, observe the notation "AT T = 996" (sec). Consequently, the time for entry n_1 as shown at t_1 is 49157 + 996; at n_2, 49157 + 992; at n_3, 49157 + 988, etc across the row of 25 entries – time decreasing by 4 sec for each interval. Therefore time has decreased by 100 sec by the start of the data on the lower half of page 20 ("AT T = 896"). Recall, again from Figure 1a, that data are run backwards through the algorithm in Quad 2 and Quad 4 (the white sectors). Accordingly, view the data of Quad 4 (Table 2, pages 30-34) and observe that time decreases for this quarter orbit as it did for Quad 2.

10. Quad 4 BOUNDARY LOGIC and DETERMINATION

Refer to page 30 (Table 2) for start of this detailed discussion which results in Quad 4 boundary determination parameters on page 31. Here t_1 = 52277 + 896 sec [quarter orbit start time + number of seconds elapsed beyond start time (Del T)], and start of 4-sec summing for n_1; t_2 = 52277 + 892 sec, etc. Special note must be made here of page 31 where the boundary will be met, and the lines marked Del T, Mlat, $S_1 \ldots S_5$, and LOGIC. Mlat = 10 x magnetic latitude in degrees to one decimal place. This form of Mlat is retained in Table 2 in order to preserve the format of some printing constraints encountered during algorithm development.

10.1 LOGIC

The *logic state* (LOGIC) for any given 4-sec interval, set to 0 at the start of every quarter orbit, is determined by the $S_i > h_i$ test. The possible LOGIC for a 4-sec interval is 0, 1, -1, 1, 2, or 3. If $S_i > h_i$, $\mathbf{q_i}$ is TRUE for that S_i. The time assigned is that of the start of the 4-sec interval. If $S_i > h_i$ for 3 consecutive 4-sec intervals, $\mathbf{Q_i}$ is TRUE for that S_i, LOGIC is set to 1, and the time assigned is that of the start of the 12-sec interval. That LOGIC *never* returns to 0 during this quarter orbit, but it sets to -1 if the TRUE condition is not maintained for a sufficient duration.

Possible LOGIC transitions

0 to 1	One or two Q_is are TRUE
1 to -1	TRUE for Q_is does not maintain
-1 to 1	One or two Q_i s are TRUE again
1 to 2	Three Q_is are TRUE
2 to 3	Five Q_is are TRUE

For a boundary to be determined, LOGIC must reach 2 or 3, values from which it cannot return to a lower state. When LOGIC = 2 is reached, three Q_is are TRUE. While in LOGIC = 2 state, if data are exhausted before five Q_is are TRUE, the boundary is determined, and search is complete. To reach LOGIC = 3, Q_1, Q_2, Q_3, Q_4, and Q_5 must all be TRUE, the boundary is determined, and search is complete. As Q_i becomes TRUE for its S_i, Magnetic Latitude (MLAT) of the boundary, as contributed by that S_i, is recorded in its appropriate position (replacing -999)

in Table 2. Flowcharts of this operation, leading to the boundary determination, are shown in Figures 2 through 6 for determination of Q_1... Q_5 TRUE, and will be followed for here for S_1...S_5 for the bottom half of page 31 to where the Evening Sector boundary occurs, for shaded sector Quad 4, for DMSP F16 Orbit 9, Julian Day 207 (25 July 2004).

10.2 DETERMINATION

Observations

In the top half of page 30, within the black-bordered region (where S_i values are enclosed), the $S_i > h_i$ test has never passed for a 4-sec interval, the q_i has never been TRUE, and certainly $S_i > h_i$ for three consecutive 4-sec intervals has not been TRUE. Therefore, Q_i has not been TRUE for any S_i. The same situation holds for the bottom half of page 30. Everything of interest to us in this discussion happens on page 31. Refer to Figures 2 - 6 for flowcharts generating +, *, and ^ as discussed below.

$S_i > h_i$, Test Results and Analysis

The first incidence of $S_i > h_i$ TRUE in this quarter orbit occurs for S_2 at Del T = 656, and is reflected by a "+" after the S_2 value of 30. At the same Del T, $S_i > h_i$ TRUE for S_3, as evidenced by a "+" after the S_3 value of 25. In the case of S_2, the $S_i > h_i$ TRUE does not maintain at Del T = 652, the next 4-sec interval (as seen by a lack of "*" after the S_2 value of 25). Observe the behavior of S_2, S_3, and S_4 for the remainder of the top half of page 31. Q_1...Q_5 have never proven TRUE for the span of time from Del T = 696 through Del T = 600. Note that for this case if $S_2 > h_2$ TRUE had maintained for three consecutive 4-second intervals, the three cells would have contained, in sequence, a "+" a "*" a "^" after the S_2 value in each respective cell.

On the bottom half of page 31, activity increases greatly. Note that LOGIC has gone from 0 to -1 in column 2 to column 3. This, however, is *not* an allowed transition. Transition from 0 to 1 *is* allowed, never returning to 0 again in any given quarter orbit. Also, transition 1 to -1 *is* allowed when the TRUE condition does not maintain. What has happened here is that transition 0 to 1 to -1 has occurred too rapidly to register the 0 to 1 transition. Since S_2...S_5 are have not changed considerably in this time frame, the 0 to -1 transition most probably had occurred due to change in the S_1 value.

Now note the following:

at Del T = 560, S_4 starts a sequence of "+" "*" "^"

at Del T = 556, S_1 starts a sequence of "+" "*" "^"

at Del T = 552, S_2 starts a sequence of "+" "*" "^"

at Del T = 552, S_5 starts a sequence of "+" "*" "^"

at Del T = 528, S_3 starts a sequence of "+" "*" "^"

The first full sequence is *completed* by S_4 at Del T = 552, and so LOGIC transitioned from -1 to 1 *at that time*. At that time S_1, S_2, and S_5 began or continued full sequences, and LOGIC remained at 1. When, finally, S_3 *completed* a sequence at Del T = 520, LOGIC transitioned to 2 *at that time*, since now Q_1, Q_2, and Q_3 are TRUE. Recall from the Boundary Analysis section, that although the LOGIC is set at the times reflected on page 31, the *time assigned* to these Qi TRUE events are the times of the start of the completed 12-sec intervals.

Boundary Time and Magnetic Latitude

For this boundary, the Magnetic Latitude (Mlat) for times for Qi TRUE are (yellow):

	Q_1	Q_2	Q_3	Q_4	Q_5
Mlat >>>>	570	572	585	568	572
Replacing>>>	***-999***	***-999***	***-999***	***-999***	***-999***

(in the appropriate row on page 31)

Steps in calculation:

1) Average the Mlat values ($Mlat_{Avg}$)

2) Take differences ($Mlat - Mlat_{Avg}$)

3) If all within 1° difference, assign $Mlat_{Avg}$ as the Boundary Magnetic Latitude

4) If *not* all within 1° difference, discard Mlat farthest from $Mlat_{Avg}$ and repeat from 1) until 3) is satisfied.

Calculation Illustration

	Original Mlats	Differences 5 entries	Remaining Mlats	Differences 4 entries
	56.8	-0.5	56.8	-0.5
	57.0	-0.3	57.0	-0.3
	57.2	-0.1	57.2	-0.1
	57.2	-0.1	57.2	-0.1
	58.5	**1.2**	**58.5 eliminated**	
	286.7		228.2	
Mlat Avg>>>	57.3		**57.1**	
# Entries >>>>	5.0		4.0	

Resulting Mlat is truncated to 57.0

Time corresponding to the Boundary Mlat is looked up in the ephemeris.
Here, page 31, the Del T is seen to be 556. The Boundary is at 52883 seconds (52277 + 556).

11. SPECTRAL IMAGES

Spectral images of the four orbit 9 boundary determinations (upper portion) and expanded view of each boundary (lower portion) are shown in Figures 7, 7a, and 7b as functions of UT, Local time, and Magnetic Latitude.

Figure 7	Compressed-time view of all 4 boundaries
Figure 7a	Expanded-time view - Quad 1 and Quad 2 boundaries
Figure 7b	Expanded-time view - Quad 3 and Quad 4 boundaries

Table 1. Auroral Boundaries for entire day 207

Sat ID	Index	UT sec	UT hms	Year	Day	Glat	Glon	Mlat	Mlon
F16	1	449	0:07:29	2004	207	65.1	139.0	60.4	206.8
F16	7	2293	0:38:13	2004	207	-41.8	103.7	-57.0	169.3
F16	9	3453	0:57:33	2004	207	-68.0	309.6	-56.1	16.6
F16	16	5441	1:30:41	2004	207	46.6	269.0	59.4	337.7
F16	17	6557	1:49:17	2004	207	65.5	114.0	61.2	185.3
F16	23	8385	2:19:45	2004	207	-40.4	78.7	-53.7	139.2
F16	25	9613	2:40:13	2004	207	-65.7	281.3	-53.8	0.4
F16	30	11581	3:13:01	2004	207	48.0	243.1	57.0	303.5
F16	31	12697	3:31:37	2004	207	64.2	87.2	60.6	160.9
F16	37	14601	4:03:21	2004	207	-46.1	51.1	-55.0	106.8
F16	40	15837	4:23:57	2004	207	-59.8	250.6	-51.9	338.3
F16	44	17777	4:56:17	2004	207	52.5	215.4	55.7	272.9
F16	46	18853	5:14:13	2004	207	62.0	59.8	59.2	135.1
F16	53	20813	5:46:53	2004	207	-51.6	23 2	-55.2	76.9
F16	55	22077	6:07:57	2004	207	-52.8	221.0	-51.4	310.0
F16	58	24017	6:40:17	2004	207	59.5	185.8	57.5	245.0
F16	59	25005	6:56:45	2004	207	60.0	32.7	58.0	110.4
F16	66	27005	7:30:05	2004	207	-55.9	355.4	-53.7	50.1
F16	68	28269	7:51:09	2004	207	-48.5	193.6	-53.2	281.3
F16	73	30197	8:23:17	2004	207	63.0	157.5	58.8	222.1
F16	74	31197	8:39:57	2004	207	55.8	4.5	55.2	84.9
F16	81	33177	9:12:57	2004	207	-59.0	328.0	-51.0	28.2
F16	83	34477	9:34:37	2004	207	-43.2	166.0	-53.7	248.7
F16	87	36257	10:04:17	2004	207	59.9	134.5	55.6	204.2
F16	89	37325	10:22:05	2004	207	55.1	338.6	57.7	63.4
F16	96	39381	10:56:21	2004	207	-63.9	298.6	-52.1	9.9
F16	98	40649	11:17:29	2004	207	-40.0	139.3	-54.2	215.5
F16	102	42325	11:45:25	2004	207	57.2	110.8	53.7	183.1
F16	104	43437	12:03:57	2004	207	55.4	313.3	62.8	39.2
F16	111	45593	12:39:53	2004	207	-69.0	267.3	-57.8	353.7
F16	113	46813	13:00:13	2004	207	-37.3	112.9	-52.7	182.2
F16	118	48461	13:27:41	2004	207	58.3	84.7	55.3	157.9
F16	120	49693	13:48:13	2004	207	47.4	283.9	60.1	359.2
F16	127	51617	14:20:17	2004	207	-64.1	247.5	-56.0	338.6
F16	129	**52833**	**14:40:33**	**2004**	**207**	**-42.8**	**89.4**	**-57.0**	**150.6**
F16	135	54605	15:10:05	2004	207	59.9	58.1	57.3	133.1
F16	136	55885	15:31:25	2004	207	43.0	256.7	54.7	321.5
F16	143	57657	16:00:57	2004	207	-59.8	225.5	-56.4	319.1
F16	145	58913	16:21:53	2004	207	-44.9	64.6	-55.8	121.2
F16	151	60673	16:51:13	2004	207	57.1	34.4	55.2	110.8
F16	153	61937	17:12:17	2004	207	46.7	232.7	53.8	292.4
F16	159	63705	17:41:45	2004	207	-56.0	202.5	-58.0	295.8
F16	161	64945	18:02:25	2004	207	-49.7	41.2	-56.3	94.8
F16	166	66773	18:32:53	2004	207	56.2	9.5	55.3	89.2
F16	168	67913	18:51:53	2004	207	54.7	211.0	56.9	267.9
F16	174	69749	19:22:29	2004	207	-51.9	179.2	-59.3	269.0
F16	175	70929	19:42:09	2004	207	-57.2	19.6	-58.1	69.9
F16	182	72877	20:14:37	2004	207	55.5	344.4	57.2	68.4
F16	184	73957	20:32:37	2004	207	58.8	188.0	57.1	247.0
F16	189	75689	21:01:29	2004	207	-41.8	157.8	-53.7	238.7
F16	191	76949	21:22:29	2004	207	-62.5	358.0	-58.0	49.2
F16	198	78989	21:56:29	2004	207	55.3	319.1	61.7	45.3
F16	200	80001	22:13:21	2004	207	62.9	165.6	58.9	228.3
F16	205	81793	22:43:13	2004	207	-41.2	132.6	-55.9	207.1
F16	207	83021	23:03:41	2004	207	-65.0	334.8	-56.2	32.0
F16	214	84953	23:35:53	2004	207	46.6	297.7	57.7	18.2
F16	216	86085	23:54:45	2004	207	64.6	141.8	60.0	209.2

Table 2. Boundary Analysis sheets for Orbit 9

EVENING SECTOR BOUNDARY ANALYSIS FOR QUARTER ORBIT FROM UT = 47613 LAT INTERVAL = 11 814 Q2																									
AT T = 500 (LAT(I),I=1,5) = -999 -999 -999 -999 -999																									
	t1	t2	t3	t4	t5	t6	t7	t8	t9	t10	t11	t12	t13	t14	t15	t16	t17	t18	t19	t20	t21	t22	t23	t24	t25
n_1	2	0	1	0	2	0	2	3	0	1	1	2	2	2	0	1	2	0	2	1	0	2	3	2	1
n_2	3	3	3	2	2	0	4	2	1	3	4	4	3	7	4	2	2	1	2	0	0	2	3	0	1
n_3	3	5	0	0	0	2	3	3	1	1	1	2	0	2	0	1	3	2	2	1	0	1	0	0	4
n_4	1	0	2	3	0	1	3	2	1	0	2	1	2	1	2	1	1	1	0	0	2	2	1	3	2
n_5	0	1	1	1	0	1	1	1	0	2	2	1	1	1	1	1	2	1	3	1	2	1	1	4	0
n_6	0	0	0	0	2	0	0	0	0	2	2	0	0	0	2	0	0	2	0	0	0	0	0	4	0
n_7	2	3	2	2	2	0	3	1	2	3	1	6	2	4	0	2	7	2	1	4	1	2	4	3	2
n_8	4	3	3	5	6	2	3	3	7	2	3	7	2	6	2	10	4	6	0	4	7	2	2	6	6
n_9	7	5	4	8	7	5	6	7	4	12	3	5	9	7	7	6	10	9	7	6	10	7	12	9	10
Del T	500	504	508	512	516	520	524	528	532	536	540	544	548	552	556	560	564	568	572	576	580	584	588	592	596
Mlat	369	371	374	376	378	380	382	384	386	388	391	393	395	397	399	401	403	406	408	410	412	414	416	418	420
S_1	13	11	9	15	17	7	12	11	13	19	9	18	13	17	11	18	21	19	8	14	18	11	18	22	18
S_2	0	0	0	0	0	0	5	3	0	0	0	0	0	12	0	0	0	0	0	0	0	0	0	0	0
S_3	0	0	0	0	0	0	7	5	0	0	0	0	0	11	0	0	0	0	0	0	0	0	0	0	0
S_4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
S_5	0	0	0	0	0	0	7	5	0	0	0	0	0	16	0	0	0	0	0	0	0	0	0	0	0
LOGIC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
AT T = 600 (LAT(I),I=1,5) = -999 -999 -999 -999 -999																									
n_1	1	4	0	0	2	1	0	4	2	1	1	1	3	1	4	0	0	1	0	0	2	2	0	5	0
n_2	1	3	2	4	1	3	2	2	3	4	2	4	0	3	2	1	3	3	3	2	2	0	5	3	3
n_3	0	3	2	2	1	0	3	2	1	5	3	2	1	2	0	0	5	0	3	1	2	3	4	1	0
n_4	0	5	3	2	2	1	1	2	4	0	2	4	4	1	1	0	2	2	3	2	3	1	2	2	1
n_5	0	0	2	2	4	1	3	1	0	1	0	1	2	1	1	2	2	1	2	3	3	1	3	1	1
n_6	2	0	4	2	2	6	2	2	2	2	0	0	0	0	0	6	0	0	4	0	0	0	0	2	2
n_7	0	0	5	0	3	2	5	2	2	0	3	1	3	0	4	5	3	6	1	3	2	4	1	2	2
n_8	3	5	4	5	4	8	4	6	2	7	2	4	6	3	3	5	7	7	8	6	5	9	3	6	8
n_9	12	3	9	6	6	11	5	4	7	1	12	12	4	8	9	7	10	11	8	12	9	13	7	5	11
Del T	600	604	608	612	616	620	624	628	632	636	640	644	648	652	656	660	664	668	672	676	680	684	688	692	696
Mlat	423	425	427	429	431	433	435	438	440	442	444	446	448	450	452	455	457	459	461	463	465	467	470	472	474
S_1	17	8	22	13	15	27	16	14	13	10	17	17	13	11	16	23	20	24	21	21	16	26	11	15	23
S_2	1	4	0	0	0	0	0	6	0	11	0	9	0	0	0	0	14	0	12	0	2	0	15	8	0
S_3	0	15	0	0	0	0	0	5	0	13	0	9	0	0	0	0	7	0	4	0	2	0	5	7	0
S_4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
S_5	0	11	0	0	0	0	0	7	0	14	0	10	0	0	0	0	12	0	8	0	3	0	11	11	0
LOGIC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Table 2. Boundary Analysis sheets for Orbit 9 - continued

EVENING SECTOR BOUNDARY ANALYSIS FOR QUARTER ORBIT FROM UT = 47613 LAT INTERVAL = 11 814 Q2

AT T = 700 (LAT(I),I=1,5) = -999 -999 -999 -999 -999

n_1	3	2	4	0	1	2	2	0	2	0	1	2	1	0	3	1	4	1	0	4	2	1	3	1
n_2	3	0	9	2	1	5	4	2	0	5	4	2	2	4	5	4	3	3	3	3	1	4	3	6
n_3	1	1	0	2	3	8	2	4	1	2	3	2	2	4	2	2	2	0	1	3	3	1	1	0
n_4	2	5	1	2	3	3	3	1	2	0	5	0	0	0	0	2	5	4	2	4	3	1	4	3
n_5	0	2	2	3	3	3	0	0	3	2	4	0	1	1	5	1	2	0	2	3	1	4	1	1
n_6	2	4	0	4	0	0	0	4	0	6	2	0	6	0	0	0	0	2	6	0	4	4	4	4
n_7	4	6	1	3	4	6	3	4	3	4	1	3	1	7	3	5	5	1	2	1	2	8	6	0
n_8	3	5	5	5	6	4	5	8	1	4	6	1	7	7	11	6	10	4	3	5	11	9	9	9
n_9	10	7	7	13	16	14	4	13	5	12	14	11	11	9	5	16	16	12	16	11	13	13	25	12
Del T	700	704	708	712	716	720	724	728	732	736	740	744	748	752	756	760	764	768	772	776	780	784	788	792
Mlat	476	478	480	482	484	486	488	490	492	494	496	498	501	503	505	507	509	511	513	515	518	520	522	524
S_1	19	22	13	25	26	24	12	29	9	26	23	15	25	23	19	27	31	19	27	17	30	34	44	25
S_2	0	0	14	0	6	10	6	0	0	0	9	0	0	0	7	0	4	0	0	2	0	9	4	15
S_3	0	0	14	0	3	8	12	0	0	0	4	0	0	0	12	0	7	0	0	2	0	8	9	11
S_4	0	0	27+	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
S_5	0	0	20	0	7	12	10	0	0	0	8	0	0	0	12	0	7	0	0	3	0	11	8	16
LOGIC	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

AT T = 800 (LAT(I),I=1,5) = 545 559 557 549 557

n_1	1	1	4	2	0	8	2	5	4	11	6	8	8	15	14	17	9	22	8	18	16	18	16	13
n_2	3	3	4	3	4	3	4	5	10	10	12	19	22	22	18	23	37	36	74	103	91	80	116	148
n_3	2	2	4	4	2	10	4	6	8	8	20	24	29	24	19	30	48	71	70	152	287	480	326	390
n_4	5	5	3	3	3	2	5	14	15	7	19	18	24	29	34	68	62	75	128	270	370	314	644	884
n_5	10	6	7	3	8	8	6	13	21	24	23	28	25	32	62	67	88	178	447	832	1218	1296	1176	1564
n_6	8	6	6	4	6	0	10	16	32	46	28	44	50	70	124	146	322	460	672	1936	2776	2320	2104	2504
n_7	3	6	2	5	4	4	9	36	110	66	44	95	190	157	212	297	347	552	1188	1836	3288	2968	2328	2684
n_8	2	8	9	7	10	9	20	64	131	111	112	197	440	389	338	392	580	1010	1648	1668	2080	2808	2584	3352
n_9	11	22	19	22	12	22	47	113	243	258	277	472	742	644	676	770	1072	1084	1776	2272	2656	3072	2216	3960
Del T	800	804	808	812	816	820	824	828	832	836	840	844	848	852	856	860	864	868	872	876	880	884	888	892
Mlat	528	530	533	535	537	539	541	543	545	547	549	551	553	555	557	559	561	564	566	568	570	572	574	576
S_1	24	42	36	38	32	35	86	229	516+	481*	461^	808^	***^	***^	***^	***^	***^	***^	***^	***^	***^	***^	***^	***^
S_2	12	9	2	4	15	10	6	10	15	8	17	17	21	11	21	29+	40*	49^	109^	151^	198^	210^	198^	236^
S_3	12	7	7	2	11	11	4	9	13	20+	8	10	6	7	27+	22*	24^	51^	105^	140^	170^	176^	138^	161^
S_4	28+	21	0	0	21	3	15	32+	36*	17	37+	28*	27^	30^	65^	81^	84^	122^	205^	295^	371^	376^	395^	462^
S_5	18	11	7	4	16	15	7	16	21	21	18	18	19	14	40+	42*	46^	77^	160^	218^	269^	274^	245^	288^
LOGIC	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	2	2	2	2	2	2	2

Table 2. Boundary Analysis sheets for Orbit 9 - continued

EVENING SECTOR BOUNDARY ANALYSIS FOR QUARTER ORBIT FROM UT = 47613 LAT INTERVAL = 11 814 Q2

AT T = 900 (LAT(I),I=1,5) = 545 559 557 549 557																									
n_1	21	16	22	25	32	20	43	48	51	50	38	171	410	791	136	121	81	40	56	14	39	1009	557	****	****
n_2	128	209	194	172	198	467	420	944	638	1084	1074	3096	5960	3484	1736	1050	1686	1314	1138	192	939	****	4250	****	****
n_3	468	1022	622	624	680	1436	1864	1656	1632	2212	2496	4712	6120	4672	3512	4048	****	****	5400	864	****	****	9672	6392	4368
n_4	1084	1268	1228	810	798	1072	1148	1168	1276	2112	2528	2888	3416	3888	3648	****	****	****	****	3836	****	****	3800	2512	2588
n_5	1376	1248	1088	688	646	896	988	1212	1012	2340	2560	3084	3920	2800	2616	6480	****	****	****	****	****	4904	2039	1384	1596
n_6	1424	1264	868	592	512	808	1184	1488	1824	3624	3864	1912	3608	2152	1912	2672	7368	****	****	****	****	2664	1702	920	1056
n_7	1348	858	682	828	680	1100	1988	2488	3928	5112	4288	3096	****	1192	1312	2290	4664	****	****	****	****	1984	1728	824	1070
n_8	1524	792	1114	1992	1724	1968	2776	3088	5400	5424	3792	4048	****	534	546	1898	6292	7296	5584	5296	6080	2218	1668	810	756
n_9	1496	1532	3004	4360	3328	2568	2240	2312	4856	5088	2324	6904	2732	297	214	4094	7504	****	1856	2272	6480	2488	5000	940	1092
Del T	900	904	908	912	916	920	924	928	932	936	940	944	948	952	956	960	964	968	972	976	980	984	988	992	996
Mlat	580	582	584	586	588	590	592	595	597	599	601	603	605	607	609	611	613	615	617	619	621	623	625	626	628
S_1	***^	***^	***^	***^	***^	***^	***^	***^	***^	***^	***^	***^	***^	***^	***^	***^	***^	***^	***^	***^	***^	***^	***^	***^	***^
S_2	1236^	251^	225^	182^	179^	246^	283^	247^	249^	306^	336^	0^	0^	0^	372^	134^	0^	0^	97^	325^	101^	102^	110^	139^	0^
S_3	8133^	98^	105^	72^	69^	90^	117^	78^	94^	105^	114^	140^	180^	142^	140^	161^	45^	0^	71^	0^	38^	38^	229^	0^	181^
S_4	465^	456^	436^	336^	319^	333^	361^	284^	334^	497^	557^	350^	112^	295^	554^	***^	***^	***^	***^	***^	***^	703^	135^	***^	***^
S_5	1267^	242^	236^	178^	172^	219^	262^	209^	223^	277^	305^	346^	412^	294^	335^	761^	0^	0^	0^	992^	782^	***^	607^	826^	885^
LOGIC	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
AT T = 1000 (LAT(I),I=1,5) = 545 559 557 549 557																									
n_1	****	****	****	****	8744	5072	2468	1628	1494	909	8217	8	4	5	6	1	1	1	10	4	2	1	4	4	2
n_2	****	****	****	****	****	8472	5816	3784	3584	****	****	53	13	11	17	14	6	6	75	19	4	3	4	4	6
n_3	6248	5568	5264	****	5096	5360	3960	2792	2904	****	****	252	56	61	74	48	21	21	296	24	7	4	5	5	0
n_4	5224	3304	4576	9896	9544	****	3108	1432	1740	****	****	981	164	254	463	134	37	54	461	17	7	6	9	11	4
n_5	3600	2948	3104	3480	****	****	3504	2056	1744	7688	7848	1454	1020	1554	7028	569	88	94	531	21	13	17	16	10	16
n_6	2128	2584	2104	2520	4840	****	9100	1396	2240	4744	5768	1624	4656	4800	****	1286	194	426	1394	50	30	28	32	24	20
n_7	2096	2288	1708	2368	5188	****	****	654	7836	5720	4680	1716	8936	2356	****	1506	1201	740	1165	145	46	37	40	29	43
n_8	2312	2132	1536	1792	2820	****	****	2448	****	4436	5168	4848	8152	1132	****	2486	1560	985	1390	436	107	40	46	49	51
n_9	4420	2464	1768	2028	2160	****	****	3044	****	8488	7548	5952	5472	1230	5624	1142	4428	1405	5351	635	155	60	49	55	52
Del T	1000	1004	1008	1012	1016	1020	1024	1028	1032	1036	1040	1044	1048	1052	1056	1060	1064	1068	1072	1076	1080	1084	1088	1092	1096
Mlat	630	632	634	636	638	640	642	644	646	648	650	652	654	655	657	659	661	663	665	667	669	671	673	675	677
S_1	***^	***^	***^	***^	***^	***^	***^	***^	***^	***^	***^	***^	***^	***^	***^	***^	***^	***^	***^	***^	338^	165^	167^	157^	166^
S_2	0^	42^	94^	0^	0^	0^	233^	194^	193^	0^	21^	265^	241^	309^	748^	168^	55^	60^	146^	24^	12^	18^	10^	8^	16^
S_3	0^	0^	172^	121^	55^	0^	111^	132^	127^	0^	86^	160^	191^	237^	0^	133^	42^	40^	70^	8^	11^	18^	14^	8^	21^
S_4	***^	***^	***^	666^	221^	***^	183^	261^	223^	148^	***^	481^	339^	421^	862^	259^	105^	115^	287^	24^	31^	39^	34^	28^	26^
S_5	1926^	0^	727^	417^	366^	883^	230^	222^	211^	0^	0^	304^	305^	383^	885^	214^	70^	72^	154^	20^	17^	27^	20^	14^	28^
LOGIC	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3

Table 2. Boundary Analysis sheets for Orbit 9 - continued

EVENING SECTOR BOUNDARY ANALYSIS FOR QUARTER ORBIT FROM UT = 47613 LAT INTERVAL = 11 814 Q2

AT T = 1100 (LAT(I),I=1,5) = 545 559 557 549 557

n_1	3	4	0	2	1	2	1	0	1	0	1	2	0	4	1	2	2	4	0	1	1	3	1	1	1
n_2	3	6	0	4	3	3	3	4	1	2	7	1	6	5	7	4	2	3	0	4	4	4	2	6	1
n_3	3	7	7	1	4	3	5	6	0	4	3	4	4	4	3	5	1	5	4	2	4	5	3	0	4
n_4	7	8	10	9	9	15	6	13	14	16	9	14	14	8	17	12	8	9	9	12	9	15	16	9	15
n_5	17	20	19	12	20	16	19	30	25	23	19	28	19	23	19	20	22	21	20	21	23	19	27	24	17
n_6	16	34	30	30	26	24	14	28	54	28	30	26	18	28	42	36	28	24	38	30	32	30	42	36	18
n_7	37	29	30	39	42	55	41	46	52	41	42	36	47	40	37	33	27	48	33	50	36	39	31	49	33
n_8	44	36	63	38	44	62	54	66	104	88	75	61	48	56	67	44	45	63	69	59	36	43	35	24	23
n_9	37	41	55	45	53	55	73	76	282	143	82	68	66	61	65	55	49	63	71	58	43	49	38	28	36
Del T	1100	1104	1108	1112	1116	1120	1124	1128	1132	1136	1140	1144	1148	1152	1156	1160	1164	1168	1172	1176	1180	1184	1188	1192	1196
Mlat	679	681	683	684	686	688	690	691	693	695	697	699	700	702	704	706	708	710	711	713	715	716	718	720	722
S_1	134^	140^	178^	152^	165^	196^	182^	216^	492^	300^	229^	191^	179^	185^	211^	168^	149^	198^	211^	197^	147^	161^	146^	137^	110^
S_2	13^	12^	30^	14^	21^	20^	19^	31^	33^	32^	20^	28^	25^	15^	23^	18^	22^	15^	31^	23^	22^	17^	30^	25^	25^
S_3	18^	17^	17^	13^	19^	15^	20^	24^	24^	19^	18^	23^	15^	21^	15^	16^	23^	19^	20^	19^	21^	15^	22^	24^	15^
S_4	36^	34^	53^	32^	46^	46^	42^	59^	59^	59^	37^	60^	47^	39^	46^	45^	47^	41^	53^	48^	47^	46^	60^	45^	53^
S_5	25^	23^	32^	21^	30^	27^	29^	39^	41^	36^	27^	39^	28^	29^	29^	27^	36^	27^	35^	32^	33^	26^	39^	37^	30^
LOGIC	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3

AT T = 1200 (LAT(I),I=1,5) = 545 559 557 549 557

n_1	2	1	0	1	2	3	0	0	1	1	3	3	2	1	1	3	3	2	1	2	0	1	3	0	1
n_2	5	4	3	4	4	2	1	5	8	1	1	1	1	1	1	3	3	2	4	5	5	5	2	3	0
n_3	5	7	6	2	2	2	3	7	4	3	0	3	6	2	5	4	6	4	3	7	2	5	1	0	6
n_4	9	8	12	9	10	16	13	13	10	11	10	14	10	11	8	13	8	11	12	5	10	12	11	13	10
n_5	27	25	25	17	16	20	18	18	12	21	25	21	26	22	23	15	23	19	11	15	19	13	14	24	27
n_6	34	18	30	26	30	24	34	16	32	20	24	28	24	26	34	20	28	30	28	20	22	6	18	24	28
n_7	33	28	35	31	34	31	30	41	39	47	36	44	31	36	35	34	38	33	22	16	17	23	23	36	28
n_8	30	28	29	45	30	44	34	29	40	36	35	41	31	35	41	44	61	49	30	18	32	27	33	41	41
n_9	28	35	25	33	42	29	24	35	29	41	30	48	43	35	41	29	70	43	29	21	9	27	30	48	45
Del T	1200	1204	1208	1212	1216	1220	1224	1228	1232	1236	1240	1244	1248	1252	1256	1260	1264	1268	1272	1276	1280	1284	1288	1292	1296
Mlat	723	725	727	729	730	732	734	736	737	739	740	742	744	745	747	748	750	752	753	755	756	758	760	761	763
S_1	125^	109^	119^	135^	136^	128^	122^	121^	140^	144^	125^	161^	129^	132^	151^	127^	197^	155^	109^	75^	80^	83^	104^	149^	142^
S_2	21^	23^	29^	19^	16^	22^	29^	24^	17^	26^	25^	22^	25^	27^	25^	15^	17^	19^	17^	13^	24^	17^	16^	33^	31^
S_3	24^	22^	21^	17^	15^	18^	17^	13^	9^	20^	25^	19^	23^	21^	22^	13^	21^	17^	11^	15^	18^	10^	15^	23^	24^
S_4	48^	48^	55^	41^	39^	51^	53^	46^	27^	53^	52^	52^	55^	53^	52^	41^	44^	47^	37^	29^	44^	38^	40^	55^	59^
S_5	35^	34^	35^	27^	25^	32^	32^	26^	18^	34^	40^	32^	36^	36^	35^	23^	30^	29^	21^	20^	30^	20^	25^	40^	40^
LOGIC	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3

Table 2. Boundary Analysis sheets for Orbit 9 - continued

EVENING SECTOR BOUNDARY ANALYSIS FOR QUARTER ORBIT FROM UT = 47613 LAT INTERVAL = 11 814 Q2																									
AT T = 1300 (LAT(I),I=1,5) = 545 559 557 549 557																									
n_1	2	1	0	4	1	0	1	1	4	1	1	1	1	3	0	1	2	1	1	1	0	4	1	3	4
n_2	4	5	3	7	2	3	3	4	3	1	1	2	5	3	3	3	9	2	1	2	11	1	7	3	2
n_3	2	6	4	3	9	4	2	5	3	1	3	3	6	2	4	0	3	2	3	5	3	4	2	2	7
n_4	11	12	11	7	5	10	7	7	5	10	7	9	5	11	10	4	9	12	7	10	12	10	7	6	3
n_5	20	21	21	20	7	15	24	16	13	15	13	15	8	10	11	7	12	13	13	11	15	12	9	24	17
n_6	32	12	30	32	8	18	18	12	14	18	20	34	24	18	26	22	26	14	14	14	18	24	12	28	28
n_7	43	37	27	38	28	29	38	19	30	23	23	33	31	23	20	24	23	17	33	31	18	40	36	41	61
n_8	51	36	44	47	25	34	51	18	23	29	19	22	20	31	37	38	44	36	27	33	43	32	33	47	72
n_9	45	46	38	45	23	34	39	32	19	22	17	13	26	16	28	27	25	21	30	34	36	45	27	54	65
Del T	1300	1304	1308	1312	1316	1320	1324	1328	1332	1336	1340	1344	1348	1352	1356	1360	1364	1368	1372	1376	1380	1384	1388	1392	1396
Mlat	764	766	767	769	770	772	773	775	776	778	779	781	783	784	785	786	787	789	790	791	792	793	795	796	797
S_1	171^	131^	139^	162^	84^	115^	146^	81^	86^	92^	79^	102^	101^	88^	111^	111^	118^	88^	104^	112^	115^	141^	108^	170^	226^
S_2	19^	21^	26^	13^	16^	22^	25^	17^	8^	22^	17^	19^	12^	12^	20^	11^	15^	20^	17^	17^	25^	13^	15^	19^	13^
S_3	19^	17^	19^	20^	7^	14^	25^	15^	15^	17^	14^	15^	6^	11^	10^	11^	10^	14^	14^	10^	12^	11^	9^	26^	20^
S_4	44^	47^	51^	30^	25^	44^	48^	37^	25^	46^	40^	42^	19^	32^	39^	21^	21^	44^	40^	39^	30^	36^	20^	43^	31^
S_5	30^	28^	32^	25^	16^	25^	38^	23^	19^	29^	24^	26^	12^	19^	21^	16^	17^	26^	24^	20^	24^	19^	16^	36^	25^
LOGIC	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
AT T = 1400 (LAT(I),I=1,5) = 545 559 557 549 557																									
n_1	3	0	0	2	1	5	0	3	3	2	0	0	1	0	1	3	4	2	0	1	1	3	3	1	2
n_2	4	2	2	0	4	1	1	0	3	10	2	3	4	3	4	2	1	1	0	3	2	6	6	4	6
n_3	6	1	1	3	0	2	6	8	3	9	5	10	7	9	9	7	14	13	4	14	14	16	14	11	15
n_4	10	6	8	9	10	4	22	19	22	20	21	19	31	29	31	42	45	39	39	49	36	39	47	31	29
n_5	20	19	29	30	17	22	23	61	58	35	36	40	53	71	84	86	88	93	104	102	88	110	91	90	101
n_6	32	12	48	34	16	12	52	54	78	50	42	70	82	72	92	104	152	118	104	122	180	116	148	120	136
n_7	48	26	62	67	47	50	50	78	85	66	51	91	105	131	122	160	193	167	194	200	193	181	189	209	198
n_8	51	58	128	216	77	68	61	75	73	69	60	96	126	116	143	165	197	229	199	202	196	223	191	227	182
n_9	90	86	314	626	112	80	56	34	43	53	30	55	71	54	63	114	150	144	165	154	150	176	154	180	159
Del T	1400	1404	1408	1412	1416	1420	1424	1428	1432	1436	1440	1444	1448	1452	1456	1460	1464	1468	1472	1476	1480	1484	1488	1492	1496
Mlat	798	799	801	801	802	803	804	805	805	806	807	808	809	809	810	811	812	813	813	813	813	813	814	814	814
S_1	221^	182^	552^	943^	252^	210^	219^	241^	279^	238^	183^	312^	384^	373^	420^	543^	692^	658^	662^	678^	719^	696^	682^	736^	675^
S_2	15^	27^	36^	31^	21^	18^	36^	46^	43^	26^	40^	38^	45^	56^	58^	58^	56^	62^	79^	66^	60^	60^	55^	59^	58^
S_3	17^	22^	29^	28^	18^	26^	18^	40^	38^	22^	26^	27^	31^	40^	45^	44^	42^	46^	53^	46^	44^	51^	42^	47^	51^
S_4	41^	46^	57^	59^	42^	39^	65^	86^	82^	57^	72^	72^	86^	97^	102^	108^	110^	112^	119^	119^	108^	114^	109^	105^	107^
S_5	25^	35^	46^	45^	30^	35^	38^	64^	62^	36^	47^	46^	56^	68^	75^	76^	73^	78^	91^	81^	75^	83^	72^	78^	81^
LOGIC	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3

Table 2. Boundary Analysis sheets for Orbit 9 - continued

EVENING SECTOR BOUNDARY ANALYSIS FOR QUARTER ORBIT FROM UT = 47613 LAT INTERVAL = 11 814 Q2																								
AT T = 1500 (LAT(I),I=1,5) = 545 559 557 549 557																								
n_1	2	2	1	2	2	1	1	0	0	1	2	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
n_2	5	6	1	2	3	2	4	4	3	3	0	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
n_3	11	8	15	12	8	8	7	17	11	17	7	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
n_4	38	44	45	37	37	28	48	34	40	44	30	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
n_5	89	119	105	117	100	98	91	87	94	96	91	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
n_6	130	136	154	144	144	150	176	132	114	116	130	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
n_7	194	200	198	176	190	190	194	186	171	165	187	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
n_8	205	198	197	212	246	234	173	183	151	148	170	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
n_9	170	178	156	180	168	171	120	133	124	97	137	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
Del T	1500	1504	1508	1512	1516	1520	1524	1528	1532	1536	1540	****	****	****	****	****	****	****	****	****	****	****	****	****
Mlat	814	814	815	815	815	815	815	816	815	814	814	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
S_1	699^	712^	705^	712^	748^	745^	663^	634^	560^	526^	624^	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
S_2	56^	69^	69^	70^	64^	67^	64^	59^	66^	62^	64^	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
S_3	45^	55^	49^	56^	50^	53^	44^	44^	46^	45^	50^	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
S_4	106^	121^	120^	120^	112^	109^	113^	106^	113^	114^	108^	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
S_5	75^	91^	84^	92^	84^	86^	78^	73^	80^	77^	83^	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
LOGIC	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**-1**	**-1**	**-1**	**-1**	**-1**	**-1**	**-1**	**-1**	**-1**	**-1**	**-1**	**-1**	**-1**
EXITING SEARCJ WITH ITIM = 49157 50669 813 10																								
NORB = 9 379 1 49157																								

Table 2. Boundary Analysis sheets for Orbit 9 - continued

MORNING SECTOR BOUNDARY ANALYSIS FOR QUARTER ORBIT FROM UT = 49157 LAT INTERVAL = 813 10 Q1																									
AT T = 996 (LAT(I),I=1,5) = -999 -999 -999 -999 -999																									
n_1	1	2	0	3	4	2	3	4	5	4	6	2	1	2	4	2	0	7	13	12	9	4	7	11	7
n_2	4	3	2	2	2	1	1	2	5	2	2	3	4	4	2	3	5	8	5	4	5	6	3	5	9
n_3	0	0	0	0	2	4	3	3	0	1	2	3	2	0	1	2	1	0	2	2	3	4	0	3	2
n_4	0	1	4	2	0	0	0	2	2	1	1	1	0	4	6	0	2	1	1	2	6	2	4	2	4
n_5	2	1	0	3	2	4	2	1	3	0	1	1	1	0	6	4	3	0	4	2	1	2	4	4	1
n_6	4	8	0	0	4	2	4	2	10	6	2	4	6	0	2	10	2	6	2	8	0	2	6	6	6
n_7	11	19	16	26	19	18	15	21	14	16	11	14	19	19	24	16	19	18	13	19	17	22	10	16	16
n_8	22	27	38	34	41	28	24	26	34	33	34	28	41	38	36	32	36	36	37	36	28	31	25	31	44
n_9	59	49	68	67	57	57	51	51	43	71	58	49	69	50	47	49	57	52	47	45	63	56	75	60	55
Del T	996	992	988	984	980	976	972	968	964	960	956	952	948	944	940	936	932	928	924	920	916	912	908	904	900
Mlat	367	369	371	373	375	377	379	381	383	385	387	389	391	393	395	397	399	401	403	405	407	409	411	413	415
S_1	96	103	122	127	121	105	94	100	101	126	105	95	135	107	109	107	114	112	99	108	108	111	116	113	121
S_2	10	0	0	0	0	7	0	5	8	0	10	0	0	0	7	5	16	12	16	16	9	5	11	13	9
S_3	80	0	0	0	0	10	0	6	7	0	8	0	0	0	8	10	6	22+	12	11	13	7	7	8	14
S_4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	17	0	0	36+	30*	30^	18	0	0	25+	27*
S_5	10	0	0	0	0	12	0	7	12	0	13	0	0	0	12	10	13	23	22	22	14	9	13	16	16
LOGIC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-1	-1	-1	-1	-1	-1
AT T = 896 (LAT(I),I=1,5) = -999 -999 -999 -999 -999																									
n_1	4	10	8	7	8	7	6	9	11	4	5	4	9	5	7	6	7	8	7	6	4	10	5	7	8
n_2	11	6	2	11	5	11	8	13	9	10	5	5	4	5	11	12	7	12	13	11	8	14	7	11	11
n_3	5	3	4	4	2	5	7	9	4	6	4	4	6	5	2	5	8	9	1	3	13	6	4	7	4
n_4	8	4	2	3	5	3	5	5	1	5	6	2	5	3	7	4	12	6	6	10	5	8	9	12	12
n_5	2	7	4	5	3	4	2	4	5	14	6	5	8	11	10	5	6	16	9	12	4	6	8	10	7
n_6	8	4	12	8	6	6	10	4	16	4	12	6	4	8	10	4	6	14	4	10	8	10	10	12	10
n_7	9	16	20	20	24	21	20	18	30	18	31	23	15	26	29	25	21	22	25	27	27	16	23	23	19
n_8	29	39	37	32	27	25	29	44	43	45	55	55	57	49	47	53	41	55	53	32	43	32	40	48	37
n_9	52	54	57	53	48	52	59	53	55	56	63	74	60	50	59	64	59	61	67	56	56	52	72	67	67
Del T	896	892	888	884	880	876	872	868	864	860	856	852	848	844	840	836	832	828	824	820	816	812	808	804	800
Mlat	417	419	421	424	426	428	430	432	434	436	438	440	442	444	446	448	450	452	454	456	458	460	462	464	466
S_1	98	113	126	113	105	104	118	119	144	123	161	158	136	133	145	146	127	152	149	125	134	110	145	150	133
S_2	12	9	11	9	8	8	4	7	10	11	2	3	8	5	9	10	4	7	13	10	12	8	5	6	7
S_3	14	7	6	8	6	9	10	10	11	13	2	6	5	13	9	8	8	12	11	9	12	7	5	5	9
S_4	12	12	0	23	13	25+	18	27+	31*	11	5	0	0	10	2	21	9	4	11	10	8	20	12	8	0
S_5	15	12	12	13	11	13	10	13	17	16	3	6	8	13	13	13	9	13	17	14	15	12	8	8	12
LOGIC	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1

Table 2. Boundary Analysis sheets for Orbit 9 - continued

MORNING SECTOR BOUNDARY ANALYSIS FOR QUARTER ORBIT FROM UT = 49157 LAT INTERVAL = 813 10 Q1																									
AT T = 796 (LAT(I),I=1,5) = -999 -999 -999 -999 -999																									
n_1	6	12	15	11	14	12	10	12	15	12	12	14	16	15	11	12	13	16	11	4	9	20	17	21	26
n_2	9	13	5	8	9	15	12	13	9	11	7	13	13	10	13	9	12	14	10	7	17	13	21	18	24
n_3	8	9	5	8	14	13	6	11	7	7	13	9	8	8	14	5	13	15	13	9	12	11	12	26	16
n_4	11	8	9	14	4	12	12	8	11	8	11	9	8	9	7	10	7	11	19	14	11	18	20	27	19
n_5	7	10	14	6	9	16	10	9	7	7	10	12	3	13	15	14	11	16	19	16	10	12	14	15	19
n_6	4	14	6	14	6	16	14	16	18	12	16	6	12	12	6	18	10	24	30	34	20	24	24	26	30
n_7	35	26	28	32	22	24	27	36	34	37	22	30	24	27	31	24	31	35	40	57	32	22	30	41	37
n_8	39	45	45	29	45	39	41	51	36	40	41	27	28	44	55	38	44	30	63	34	44	31	40	45	34
n_9	67	65	55	58	55	65	53	64	50	50	51	61	54	54	49	48	49	66	99	71	76	113	62	58	69
Del T	796	792	788	784	780	776	772	768	764	760	756	752	748	744	740	736	732	728	724	720	716	712	708	704	700
Mlat	468	471	473	475	477	479	481	483	486	488	490	492	494	496	498	500	502	504	506	508	510	512	514	517	519
S_1	145	150	134	133	128	144	135	167	138	139	130	124	118	137	141	128	134	155	232	196	172	190	156	170	170
S_2	15	4	14	6	8	3	5	3	9	5	6	5	9	8	5	7	4	3	7	12	9	9	6	6	7
S_3	85	4	10	11	10	4	5	4	7	4	4	4	14	6	9	9	6	5	7	9	5	7	7	12	4
S_4	7	14	6	2	20	1	0	16	12	16	4	11	33+	6	4	6	14	5	27+	34*	9	5	6	4	16
S_5	7	7	16	11	14	5	8	6	11	8	7	7	17	9	10	11	8	6	12	17	9	11	10	12	9
LOGIC	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
AT T = 696 (LAT(I),I=1,5) = 533 -999 -999 -999 -999																									
n_1	38	33	30	34	46	51	72	65	87	93	101	98	111	134	151	159	191	206	231	237	296	322	337	396	416
n_2	20	19	29	25	55	51	59	75	97	88	87	113	107	131	163	154	210	219	229	253	286	325	388	367	412
n_3	26	29	27	33	38	64	63	65	77	95	94	99	124	170	155	173	178	214	236	253	298	301	360	398	422
n_4	28	25	33	28	49	60	56	85	65	98	115	105	112	147	144	168	187	218	212	273	280	314	360	396	382
n_5	19	25	42	42	45	63	52	63	94	92	116	107	116	145	178	158	193	210	216	233	278	338	388	392	430
n_6	28	36	38	54	56	74	82	98	98	92	126	118	134	172	162	194	204	206	230	260	288	368	332	388	368
n_7	37	38	45	59	79	79	103	99	101	98	135	135	138	155	155	195	192	264	247	267	330	364	430	454	434
n_8	61	46	58	51	81	61	111	105	109	136	122	145	139	163	182	198	245	262	284	303	343	394	418	502	466
n_9	82	59	75	76	93	108	109	107	134	128	149	148	184	154	192	219	224	263	261	312	336	356	440	478	514
Del T	696	692	688	684	680	676	672	668	664	660	656	652	648	644	640	636	632	628	624	620	616	612	608	604	600
Mlat	521	523	525	527	529	531	533	535	537	539	541	543	545	547	549	551	553	555	557	559	561	563	565	567	569
S_1	208	179	216	240	309	322	405+	409*	442^	454^	532^	546^	595^	644^	691^	806^	865^	995^	***^	***^	***^	***^	***^	***^	***^
S_2	14	11	4	7	7	6	8	7	9	2	8	6	4	10	5	4	7	3	3	6	3	4	11	6	4
S_3	10	4	9	11	5	4	6	11	13	3	9	3	3	7	11	4	5	2	5	10	4	7	7	3	9
S_4	14	2	18	13	6	18	20	6	18	6	28+	0	6	15	4	7	10	1	14	7	9	1	8	8	5
S_5	16	11	11	12	10	9	10	12	15	4	14	6	6	14	11	6	9	4	7	11	5	8	12	7	10
LOGIC	-1	-1	-1	-1	-1	-1	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

Table 2. Boundary Analysis sheets for Orbit 9 - continued

MORNING SECTOR BOUNDARY ANALYSIS FOR QUARTER ORBIT FROM UT = 49157 LAT INTERVAL = 813 10 Q1

AT T = 596 (LAT(I),I=1,5) = 533 601 579 577 601

n_1	468	490	480	430	364	351	420	414	384	354	402	560	444	518	624	536	314	277	470	528	514	416	334	252	255
n_2	418	500	458	428	392	384	418	422	402	408	456	606	542	610	668	704	486	456	476	530	528	440	378	338	240
n_3	456	442	458	392	404	394	436	416	398	404	448	590	538	522	584	750	362	327	368	532	329	346	396	272	239
n_4	458	454	430	518	516	458	532	430	440	446	474	560	580	506	644	642	243	268	310	354	282	226	256	202	167
n_5	476	456	448	460	666	616	554	470	460	426	444	462	438	456	536	530	273	271	299	340	269	251	275	167	118
n_6	452	528	444	436	792	632	568	352	516	424	424	412	356	416	444	472	242	224	306	344	294	214	228	152	158
n_7	484	502	492	494	1054	844	560	426	562	426	412	494	428	472	456	556	238	204	374	330	318	232	271	169	145
n_8	478	522	564	460	1044	864	556	504	496	426	432	498	472	560	586	694	257	254	361	714	412	276	263	195	190
n_9	530	586	604	498	934	884	560	548	514	454	410	472	620	634	656	826	307	348	554	822	524	294	322	204	204
Del T	596	592	588	584	580	576	572	568	564	560	556	552	548	544	540	536	532	528	524	520	516	512	508	504	500
Mlat	571	573	575	577	579	581	583	585	587	589	591	593	595	597	599	601	603	605	607	608	610	612	614	616	618
S_1	***^	***^	***^	***^	***^	***^	***^	***^	***^	***^	***^	***^	***^	***^	***^	***^	***^	***^	***^	***^	***^	***^	***^	720^	697^
S_2	9	9	6	12	31+	26	16	5	9	15	13	11	23	18	12	35+	41*	42^	26^	23^	41^	30^	19^	27^	19^
S_3	7	6	5	18	46+	43*	22^	11^	11^	9^	7^	25^	28^	18^	21^	33^	36^	28^	29^	39^	42^	38^	28^	35^	39^
S_4	15	25+	19	38+	123*	103^	75^	21^	38^	37^	19^	42^	10^	49^	31^	19^	100^	71^	109^	111^	152^	129^	67^	90^	94^
S_5	11	12	9	24	64+	56*	33	12	17	18	14	26	31	27	23	43+	58*	49^	48^	52^	72^	58^	37^	46^	46^
LOGIC	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2

AT T = 496 (LAT(I),I=1,5) = 533 601 579 577 601

n_1	205	223	288	305	207	259	358	177	331	141	90	92	74	72	99	342	465	538	488	246	186	277	350	301	177
n_2	226	304	235	300	224	250	340	157	428	176	122	91	95	86	83	260	284	324	237	165	188	210	299	228	147
n_3	208	245	211	198	211	138	243	145	241	183	114	93	133	148	105	138	253	226	391	173	191	321	490	466	264
n_4	150	186	149	151	119	88	140	95	139	127	114	112	123	123	146	102	133	143	164	138	169	289	366	389	318
n_5	89	148	130	112	90	120	133	70	108	90	100	82	78	82	115	99	126	127	137	100	154	219	296	245	224
n_6	112	110	146	116	124	156	168	92	200	166	170	126	86	112	198	194	164	138	198	138	206	252	448	420	492
n_7	120	133	163	146	169	172	208	288	339	263	221	217	242	248	299	314	224	183	195	233	273	270	550	412	986
n_8	148	155	188	227	267	278	346	1240	572	458	548	434	444	420	484	532	296	312	248	398	635	320	702	570	1386
n_9	222	205	187	341	418	402	1040	****	1080	898	1048	762	520	494	666	912	584	826	539	1090	4896	722	984	508	722
Del T	496	492	488	484	480	476	472	468	464	460	456	452	448	444	440	436	432	428	424	420	416	412	408	404	400
Mlat	620	622	624	626	628	630	632	634	636	638	640	642	644	646	648	650	652	654	656	658	660	662	664	666	667
S_1	602^	603^	684^	830^	978^	***^	***^	***^	***^	***^	***^	***^	***^	***^	***^	***^	***^	***^	***^	***^	***^	***^	***^	***^	***^
S_2	19^	26^	29^	34^	22^	38^	38^	21^	47^	18^	14^	5^	22^	27^	14^	53^	61^	73^	65^	31^	5^	22^	30^	42^	35^
S_3	43^	34^	33^	46^	44^	39^	52^	34^	70^	31^	7^	12^	23^	25^	16^	50^	59^	66^	71^	30^	11^	25^	35^	48^	31^
S_4	92^	84^	106^	139^	106^	133^	160^	92^	185^	56^	1^	7^	22^	32^	48^	163^	179^	201^	157^	85^	26^	9^	5^	41^	93^
S_5	47^	44^	50^	66^	52^	66^	76^	43^	94^	35^	13^	12^	29^	35^	24^	87^	97^	114^	100^	46^	13^	32^	46^	62^	50^
LOGIC	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3

Table 2. Boundary Analysis sheets for Orbit 9 - continued

MORNING SECTOR BOUNDARY ANALYSIS FOR QUARTER ORBIT FROM UT = 49157 LAT INTERVAL = 813 10 Q1																									
AT T = 396 (LAT(I),I=1,5) = 533 601 579 577 601																									
n_1	24	38	10	1	3	0	5	1	3	1	1	4	2	2	3	1	2	0	2	0	1	6	3	4	1
n_2	37	49	24	3	4	8	3	3	5	2	3	5	4	3	3	2	7	5	3	3	3	5	3	4	6
n_3	130	145	49	5	5	10	3	2	6	3	4	12	3	7	6	3	5	7	6	6	6	1	4	10	4
n_4	304	325	925	19	22	16	14	8	16	11	17	10	21	19	12	16	20	20	8	13	12	10	18	15	7
n_5	439	500	4365	56	42	43	37	37	48	35	21	43	30	37	35	36	31	41	15	41	26	29	20	35	42
n_6	1268	1872	****	156	76	74	90	78	84	74	68	58	70	54	98	82	78	80	86	78	88	72	48	68	88
n_7	3624	5976	****	1545	187	205	173	178	187	189	147	147	151	174	182	178	207	202	178	188	163	170	188	192	183
n_8	****	****	****	****	416	439	210	255	277	225	205	203	188	258	227	251	290	308	242	282	285	312	335	288	263
n_9	6520	8616	****	****	2034	1574	272	357	648	227	271	271	191	267	176	242	345	298	279	308	279	325	269	312	276
Del T	396	392	388	384	380	376	372	368	364	360	356	352	348	344	340	336	332	328	324	320	316	312	308	304	300
Mlat	669	671	673	675	677	679	680	682	684	686	688	690	692	694	695	697	699	701	703	705	707	708	710	712	714
S_1	***^	***^	***^	***^	***^	***^	745^	868^	***^	715^	691^	679^	600^	753^	683^	753^	920^	888^	785^	856^	815^	879^	840^	860^	810^
S_2	1116^	112^	534^	46^	32^	35^	25^	35^	33^	34^	26^	27^	29^	31^	26^	36^	26^	38^	14^	39^	26^	18^	21^	23^	34^
S_3	78^	84^	0^	38^	28^	29^	29^	34^	34^	30^	17^	32^	22^	26^	28^	28^	21^	28^	13^	32^	21^	26^	16^	24^	36^
S_4	250^	256^	722^	81^	71^	66^	60^	61^	70^	63^	55^	60^	63^	68^	59^	67^	58^	71^	37^	69^	55^	44^	51^	59^	60^
S_5	1147^	152^	641^	61^	47^	46^	45^	52^	52^	48^	32^	46^	40^	43^	43^	48^	37^	47^	21^	51^	35^	37^	30^	38^	53^
LOGIC	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
AT T = 296 (LAT(I),I=1,5) = 533 601 579 577 601																									
n_1	2	3	0	2	1	0	2	1	5	1	0	2	2	3	0	1	2	0	0	1	6	0	2	1	1
n_2	3	5	3	5	5	2	2	8	3	6	7	2	2	1	3	3	3	3	4	5	3	2	2	3	4
n_3	5	4	6	5	8	5	16	5	4	6	12	8	6	3	7	6	9	6	7	4	4	9	9	10	12
n_4	20	17	16	12	16	20	19	18	18	24	23	22	23	20	24	26	18	17	19	27	18	20	24	28	29
n_5	39	37	41	46	41	73	84	55	78	86	63	57	55	60	66	75	96	59	63	54	55	66	62	55	61
n_6	76	58	86	66	42	118	120	100	92	128	122	122	90	90	158	110	162	124	138	116	94	112	128	88	158
n_7	179	131	162	151	170	179	200	167	184	185	177	213	177	184	199	214	251	210	192	176	159	170	183	175	166
n_8	290	279	248	236	215	268	214	255	220	207	232	256	208	200	220	201	1260	237	186	147	175	160	174	202	160
n_9	262	268	207	213	173	190	167	214	173	162	163	188	185	205	169	331	7723	359	98	103	97	100	86	104	102
Del T	296	292	288	284	280	276	272	268	264	260	256	252	248	244	240	236	232	228	224	220	216	212	208	204	200
Mlat	716	718	720	722	723	725	727	728	730	732	734	735	737	739	741	742	744	746	748	749	751	752	754	755	757
S_1	807^	736^	703^	666^	600^	755^	701^	736^	669^	682^	694^	779^	660^	679^	746^	856^	***^	930^	614^	542^	525^	542^	571^	569^	586^
S_2	33^	27^	40^	34^	33^	61^	55^	40^	48^	57^	46^	44^	44^	46^	54^	56^	62^	50^	50^	44^	34^	54^	46^	45^	46^
S_3	28^	27^	30^	35^	29^	46^	49^	37^	49^	49^	37^	36^	36^	41^	40^	44^	56^	40^	41^	34^	38^	42^	38^	32^	34^
S_4	70^	62^	71^	66^	67^	94^	97^	74^	89^	98^	85^	84^	83^	84^	91^	96^	102^	83^	86^	83^	74^	90^	88^	86^	89^
S_5	46^	43^	50^	53^	46^	75^	76^	58^	76^	79^	60^	60^	59^	66^	67^	73^	87^	65^	66^	58^	58^	68^	62^	56^	58^
LOGIC	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3

Table 2. Boundary Analysis sheets for Orbit 9 - continued

MORNING SECTOR BOUNDARY ANALYSIS FOR QUARTER ORBIT FROM UT = 49157 LAT INTERVAL = 813 10 Q1																									
AT T = 196 (LAT(I),I=1,5) = 533 601 579 577 601																									
n_1	3	2	2	2	0	4	0	0	1	4	5	1	2	0	4	1	2	4	1	2	0	0	1	1	0
n_2	7	4	4	2	3	6	0	2	5	1	3	3	1	3	5	3	3	2	5	2	8	2	5	3	10
n_3	8	5	7	9	9	8	8	5	10	6	10	11	8	5	12	10	11	6	6	9	11	6	8	6	3
n_4	22	26	19	24	24	22	19	17	18	28	13	17	25	16	25	20	33	24	28	30	18	36	25	21	20
n_5	57	63	69	56	71	48	70	52	39	50	51	54	53	48	57	80	76	61	54	84	58	61	64	67	37
n_6	122	134	106	102	94	118	116	94	88	134	150	128	132	128	140	124	128	134	154	180	120	116	116	114	102
n_7	189	151	191	190	154	157	195	179	172	184	200	203	208	226	221	218	212	206	229	234	219	229	195	218	231
n_8	151	196	194	174	159	196	170	185	195	166	204	239	263	230	236	240	240	257	236	265	265	273	273	255	243
n_9	117	143	135	118	111	108	119	88	97	106	145	200	202	205	189	201	202	190	185	225	250	181	226	200	238
Del T	196	192	188	184	180	176	172	168	164	160	156	152	148	144	140	136	132	128	124	120	116	112	108	104	100
Mlat	759	760	762	763	765	767	768	770	772	773	774	776	777	779	780	781	783	784	786	787	788	790	791	793	794
S_1	579^	624^	626^	584^	518^	579^	600^	546^	552^	590^	699^	770^	805^	789^	786^	783^	782^	787^	804^	904^	854^	799^	810^	787^	814^
S_2	36^	46^	48^	43^	55^	31^	61^	49^	32^	39^	31^	42^	44^	44^	36^	56^	52^	42^	44^	57^	42^	56^	47^	51^	35^
S_3	35^	39^	44^	35^	42^	30^	45^	37^	26^	31^	36^	36^	33^	35^	33^	48^	41^	38^	33^	46^	37^	35^	38^	42^	26^
S_4	77^	87^	87^	84^	94^	71^	94^	80^	67^	82^	70^	79^	84^	76^	80^	96^	99^	85^	83^	103^	78^	96^	87^	89^	62^
S_5	55^	64^	69^	58^	69^	48^	73^	61^	43^	54^	53^	57^	57^	57^	53^	76^	68^	62^	56^	76^	57^	64^	63^	69^	44^
LOGIC	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
AT T = 96 (LAT(I),I=1,5) = 533 601 579 577 601																									
n_1	2	2	1	1	1	2	2	0	1	4	1	2	4	2	3	2	0	2	1	2	3	4	4	0	2
n_2	1	2	4	5	6	1	1	4	6	2	5	3	2	1	5	2	3	2	4	6	6	9	2	5	6
n_3	3	4	4	8	6	5	8	6	2	18	8	6	9	8	9	5	4	9	6	3	12	5	10	12	14
n_4	14	16	14	12	16	20	24	18	18	20	17	17	24	17	20	17	16	23	20	27	31	34	28	43	36
n_5	49	42	33	36	34	23	42	45	45	30	57	52	65	48	50	36	34	38	55	54	95	89	97	72	78
n_6	94	86	76	92	104	80	86	72	74	70	68	96	96	92	84	68	64	90	94	112	102	140	140	112	150
n_7	213	219	203	201	174	185	205	180	181	176	154	158	171	177	156	189	181	152	186	171	137	145	181	177	205
n_8	282	241	289	235	186	194	229	208	186	188	194	180	199	190	181	205	179	173	212	160	173	159	183	161	190
n_9	223	197	191	176	116	123	146	132	92	98	104	116	112	139	105	120	112	94	98	100	87	109	130	106	116
Del T	96	92	88	84	80	76	72	68	64	60	56	52	48	44	40	36	32	28	24	20	16	12	8	4	0
Mlat	795	796	797	798	799	800	801	802	803	804	805	806	807	808	808	809	809	810	810	811	811	812	812	813	813
S_1	812^	743^	759^	704^	580^	582^	666^	592^	533^	532^	520^	550^	578^	598^	526^	582^	536^	509^	590^	543^	499^	553^	634^	556^	661^
S_2	42^	36^	30^	30^	29^	28^	38^	41^	38^	27^	42^	40^	43^	39^	34^	32^	36^	34^	43^	41^	54^	50^	58^	55^	50^
S_3	38^	32^	26^	28^	25^	18^	27^	32^	33^	17^	38^	36^	39^	34^	32^	27^	27^	25^	36^	34^	49^	47^	52^	36^	39^
S_4	75^	70^	61^	60^	60^	60^	77^	74^	70^	62^	79^	77^	87^	76^	74^	67^	66^	72^	80^	81^	104^	99^	106^	102^	99^
S_5	60^	51^	43^	43^	40^	35^	49^	52^	53^	33^	59^	57^	63^	54^	51^	45^	45^	44^	59^	57^	78^	75^	83^	65^	66^
LOGIC	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
EXITING SEARCH WITH ITIM = 50673 52273 14 874																									
NORB = 9 401 3 50673																									

Table 2. Boundary Analysis sheets for Orbit 9 - continued

MORNING SECTOR BOUNDARY ANALYSIS FOR QUARTER ORBIT FROM UT = 50673 LAT INTERVAL = 14 874 Q1

AT T = 600 (LAT(I),I=1,5) = -999 -999 -999 -999 -999

n_1	3	3	3	2	2	4	3	3	3	1	2	4	3	4	8	5	5	5	7	6	8	9	6	5	8
n_2	4	2	1	6	7	4	0	3	7	4	2	6	8	5	9	6	7	12	14	5	7	10	12	7	6
n_3	3	4	4	1	3	2	6	0	1	4	3	5	6	3	3	6	5	6	5	7	10	6	12	14	6
n_4	5	3	1	0	2	1	4	1	1	0	5	4	7	12	3	4	8	6	5	4	5	13	9	10	6
n_5	5	1	2	1	6	3	3	5	2	9	6	2	6	3	7	5	5	3	5	5	4	7	6	8	9
n_6	0	0	2	0	4	2	2	4	6	0	14	4	2	6	6	6	10	8	4	18	4	10	8	4	6
n_7	17	20	8	13	11	9	7	13	11	18	10	15	3	18	9	17	16	17	13	17	15	18	17	6	11
n_8	28	31	26	30	26	27	28	24	25	29	22	31	17	29	29	22	33	24	32	24	37	23	34	40	34
n_9	49	62	47	47	64	54	51	59	66	55	52	46	62	53	41	42	62	63	53	55	66	64	50	62	54
Del T	600	604	608	612	616	620	624	628	632	636	640	644	648	652	656	660	664	668	672	676	680	684	688	692	696
Mlat	383	385	387	389	391	393	395	397	399	401	403	405	407	409	411	413	415	417	419	421	423	425	427	429	431
S_1	94	113	83	90	105	92	88	100	108	102	98	96	84	106	85	87	121	112	102	114	122	115	109	112	105
S_2	13	4	6	0	11	5	11	7	11	12	6	4	9	9	7	2	4	11	11	3	4	5	9	11	3
S_3	3	8	6	0	9	6	7	11	10	16	6	7	3	16	9	3	5	10	9	4	8	9	8	7	5
S_4	0	0	0	0	0	0	0	0	0	0	21	0	5	15	16	6	2	19	24	6	15	2	7	14	2
S_5	15	7	8	0	12	8	12	12	15	19	10	7	8	17	12	3	6	14	15	5	9	9	10	12	5
LOGIC	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

AT T = 700 (LAT(I),I=1,5) = -999 -999 -999 -999 -999

n_1	6	8	7	11	9	10	15	13	10	9	19	12	13	16	12	21	20	12	16	22	17	15	12	20	12
n_2	5	14	7	19	10	8	8	13	20	11	10	18	13	14	18	20	14	22	20	13	19	15	22	18	15
n_3	11	10	8	15	4	13	14	17	13	22	22	7	13	13	24	13	15	18	17	16	25	19	14	13	13
n_4	12	7	9	10	13	7	13	11	8	7	14	15	14	12	11	16	18	22	19	14	15	15	18	21	8
n_5	5	4	7	10	14	8	5	12	14	9	18	7	17	15	11	15	15	15	23	19	16	11	11	18	13
n_6	12	14	14	8	6	14	22	12	6	14	24	12	18	14	22	20	6	12	20	8	16	14	14	8	24
n_7	18	20	15	17	25	26	17	28	27	17	24	27	19	26	26	23	26	23	29	21	27	22	27	40	37
n_8	32	35	38	32	36	39	51	37	34	46	36	41	48	41	40	45	34	38	32	61	51	40	34	44	52
n_9	56	69	45	66	71	62	73	68	59	61	68	58	58	69	72	68	54	64	61	62	69	65	59	94	98
Del T	700	704	708	712	716	720	724	728	732	736	740	744	748	752	756	760	764	768	772	776	780	784	788	792	796
Mlat	433	435	437	439	441	443	445	447	449	451	453	455	457	459	461	463	465	467	469	471	473	475	477	479	481
S_1	118	138	112	123	138	141	163	145	126	138	152	138	143	150	160	156	120	137	142	152	163	141	134	186	211
S_2	18	8	2	9	7	5	9	4	12	13	10	10	2	3	11	6	6	11	4	9	6	3	11	5	4
S_3	11	11	3	7	9	6	13	5	9	14	7	12	4	3	12	4	3	7	5	6	7	7	9	5	6
S_4	14	23	5	18	15	7	10	5	14	8	5	14	8	5	14	15	1	4	9	3	8	7	8	1	11
S_5	13	13	3	12	13	8	14	6	13	19	12	15	5	4	16	9	6	11	6	9	10	8	12	8	8
LOGIC	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**-1**	**-1**	**-1**	**-1**	**-1**	**-1**	**-1**	**-1**	**-1**	**-1**	**-1**

Table 2. Boundary Analysis sheets for Orbit 9 - continued

MORNING SECTOR BOUNDARY ANALYSIS FOR QUARTER ORBIT FROM UT = 50673 LAT INTERVAL = 14 874 Q1																									
AT T = 800 (LAT(I),I=1,5) = 524 -999 -999 -999 -999																									
n_1	12	9	14	21	16	16	21	22	28	27	35	21	26	34	45	31	27	43	37	49	63	55	69	83	99
n_2	19	22	12	15	12	20	14	19	21	29	28	35	27	41	40	41	36	34	50	54	74	74	93	80	108
n_3	14	10	20	16	21	23	25	16	28	34	29	49	42	41	33	28	29	39	43	60	82	67	98	95	124
n_4	17	19	21	26	16	17	12	20	21	24	26	27	28	36	40	24	29	45	54	51	63	68	99	94	121
n_5	11	27	23	18	24	25	14	22	26	19	30	38	28	34	36	34	41	43	51	57	75	70	72	105	138
n_6	38	32	16	30	42	12	30	22	26	30	44	38	38	34	50	32	30	52	48	58	60	96	82	102	126
n_7	54	47	37	53	44	35	32	36	27	43	48	44	49	44	60	41	48	50	60	63	85	68	97	120	122
n_8	93	113	72	57	47	53	52	59	71	67	59	76	74	92	68	97	60	66	85	110	103	102	114	140	184
n_9	297	310	158	103	124	101	83	144	97	93	119	142	100	153	126	116	116	110	111	181	136	202	197	259	314
Del T	800	804	808	812	816	820	824	828	832	836	840	844	848	852	856	860	864	868	872	876	880	884	888	892	896
Mlat	483	485	488	490	492	494	496	498	500	502	505	507	509	511	513	515	517	520	522	524	526	528	530	532	534
S_1	482+	502*	283	243	257	201	197	261	221	233	270	300	261	323	304	286	254	278	304	412+	384*	468^	490^	621^	746^
S_2	8	16	8	7	7	6	9	4	6	5	6	18	9	5	6	9	7	6	9	5	8	10	14	6	10
S_3	7	13	6	8	9	7	10	4	5	10	3	12	8	4	4	8	9	4	5	4	7	3	14	7	9
S_4	5	22	27+	12	18	9	15	1	2	17	8	11	4	5	9	16	8	11	17	4	0	7	6	25+	32*
S_5	19	20	12	11	12	9	14	6	7	12	6	20	13	6	8	12	11	7	11	6	10	9	17	11	15
LOGIC	**-1**	**-1**	**-1**	**-1**	**-1**	**-1**	**-1**	**-1**	**-1**	**-1**	**-1**	**-1**	**-1**	**-1**	**-1**	**-1**	**-1**	**-1**	**-1**	**1**	**1**	**1**	**1**	**1**	**1**
AT T = 900 (LAT(I),I=1,5) = 524 560 560 532 560																									
n_1	122	175	219	229	316	303	320	358	386	438	480	518	564	614	656	660	694	670	626	540	496	514	516	418	420
n_2	154	169	213	246	288	294	343	356	454	428	516	548	588	614	618	686	720	672	608	616	490	514	560	546	550
n_3	160	209	240	239	277	280	376	384	394	532	528	616	716	776	674	700	756	764	662	666	662	542	786	792	694
n_4	174	179	219	246	282	318	390	474	410	532	580	692	812	1080	1188	950	1112	1162	1320	1560	970	782	962	1488	1680
n_5	169	177	251	253	316	346	342	408	414	534	602	844	1088	1296	1280	1364	1984	2376	2584	3904	3112	2784	2424	2944	2896
n_6	190	228	258	258	320	280	388	456	452	572	592	920	1072	1264	1320	1552	2176	3224	4024	5208	5400	4696	3400	4472	4248
n_7	194	230	281	283	320	317	366	424	450	486	588	908	1080	1376	1540	1408	2128	3080	4792	6088	6808	5672	5440	4880	3952
n_8	215	249	358	382	388	452	462	496	574	618	800	1448	1528	1844	2204	1864	2944	3336	5720	4688	5800	7256	6136	6280	5128
n_9	288	410	642	548	600	588	622	640	740	872	944	2004	2096	2520	3248	2928	4208	4952	5032	7016	6216	5880	5496	5144	4032
Del T	900	904	908	912	916	920	924	928	932	936	940	944	948	952	956	960	964	968	972	976	980	984	988	992	996
Mlat	537	539	541	543	545	547	549	552	554	556	558	560	563	565	567	569	571	574	576	578	580	582	585	587	589
S_1	887^	***^	***^	***^	***^	***^	***^	***^	***^	***^	***^	***^	***^	***^	***^	***^	***^	***^	***^	***^	***^	***^	***^	***^	***^
S_2	16	9	6	5	9	7	12	15	14	19	14	30+	44*	62^	64^	51^	86^	114^	139^	228^	187^	163^	136^	195^	200^
S_3	7	8	9	3	10	13	11	18	6	13	14	40+	60*	71^	75^	84^	140^	176^	193^	281^	261^	253^	197^	212^	205^
S_4	36^	6^	17^	10^	2^	26^	25^	56^	5^	61^	54^	119^	171^	235^	240^	201^	302^	369^	427^	582^	484^	425^	396^	520^	533^
S_5	18	12	12	6	12	16	16	27	14	27	23	57+	86*	114^	121^	113^	188^	241^	279^	418^	368^	344^	272^	330^	331^
LOGIC	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**

Table 2. Boundary Analysis sheets for Orbit 9 - continued

MORNING SECTOR BOUNDARY ANALYSIS FOR QUARTER ORBIT FROM UT = 50673 LAT INTERVAL = 14 874 Q1

AT T = 1000 (LAT(I),I=1,5) = 524 560 560 532 560

n_1	396	368	414	379	290	239	230	176	174	144	117	110	159	167	393	628	478	790	642	756	406	73	135	108	677
n_2	650	586	434	414	434	354	409	356	285	341	352	284	257	312	449	584	598	762	714	990	807	162	313	188	646
n_3	746	826	724	598	682	778	808	704	650	1014	1048	832	754	624	482	592	330	470	572	882	908	460	838	512	798
n_4	1336	1380	1408	1352	1092	1120	1308	1212	1228	1612	1764	1860	1708	1816	1516	1430	1172	1458	1446	1478	1284	832	868	926	1036
n_5	2904	3040	2200	2624	2420	2124	2368	2012	1836	1932	1828	2228	2128	2108	2000	1824	1500	1740	1840	1292	1222	1048	1020	960	1044
n_6	4024	4024	2968	3560	3000	2472	2744	2680	2312	2376	2408	3528	3432	3128	2840	2600	2344	2952	2776	1944	1552	1600	1624	1320	1296
n_7	3296	4192	4008	3936	3576	2976	3088	3568	2816	2544	2768	4872	4808	3656	3488	2552	3040	3184	3016	2848	2264	2356	2564	1844	1960
n_8	4648	4016	4296	4032	3432	2688	3184	4008	3008	2664	2608	5976	8792	5592	2680	2272	2624	2600	2536	2992	2992	4168	4344	2196	2736
n_9	3312	3776	3776	3144	2704	2256	3176	7776	4536	2672	2128	9200	****	5800	1872	1596	1788	1788	1784	2840	3616	9432	7304	2248	3424
Del T	1000	1004	1008	1012	1016	1020	1024	1028	1032	1036	1040	1044	1048	1052	1056	1060	1064	1068	1072	1076	1080	1084	1088	1092	1096
Mlat	591	593	596	598	600	602	604	607	609	611	613	615	618	620	622	624	626	628	630	632	635	637	639	641	643
S_1	***^	***^	***^	***^	***^	***^	***^	***^	***^	***^	***^	***^	***^	***^	***^	***^	***^	***^	***^	***^	***^	***^	***^	***^	***^
S_2	1187^	204^	161^	190^	184^	186^	205^	198^	196^	233^	246^	271^	246^	244^	162^	108^	105^	93^	103^	66^	111^	170^	157^	158^	42^
S_3	8216^	223^	161^	206^	199^	170^	179^	160^	149^	131^	124^	160^	159^	162^	156^	128^	125^	122^	126^	59^	59^	103^	74^	90^	42^
S_4	490^	521^	459^	504^	470^	465^	500^	474^	470^	513^	521^	577^	552^	549^	450^	357^	308^	291^	336^	194^	258^	379^	331^	366^	165^
S_5	1324^	341^	265^	324^	306^	278^	299^	277^	268^	273^	274^	323^	310^	315^	266^	203^	194^	183^	196^	101^	129^	207^	171^	192^	73^
LOGIC	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3

AT T = 1100 (LAT(I),I=1,5) = 524 560 560 532 560

n_1	344	312	116	29	37	36	54	50	22	4	4	4	1	3	0	6	1	2	3	4	8	1	1	1	3
n_2	613	312	341	54	65	109	117	143	42	12	13	3	6	4	5	5	7	9	7	6	4	3	5	9	5
n_3	668	532	497	194	259	281	311	525	163	25	14	6	5	3	10	3	6	8	8	9	2	9	6	4	8
n_4	926	806	402	482	664	762	814	3224	302	19	28	11	65	14	10	15	51	13	23	78	64	15	11	15	15
n_5	1052	826	590	1002	2092	3188	2344	****	157	39	285	115	1060	36	22	229	115	39	131	489	1200	22	28	50	12
n_6	1336	956	796	2168	6784	9256	6328	****	1644	1210	1540	1030	842	472	54	2184	636	492	766	1412	****	82	182	276	14
n_7	2096	1220	1094	****	****	****	****	****	8928	3513	4648	5080	7600	6745	212	3400	1940	1456	3020	****	****	3322	****	****	44
n_8	3272	1982	1956	****	****	****	****	****	6256	4154	9568	****	****	7936	2132	7176	4616	2880	5516	****	****	****	****	5065	61
n_9	5696	2900	1588	****	****	9752	****	****	6912	6144	****	4996	****	5992	6072	5232	****	2164	4752	****	****	****	****	2208	53
Del T	1100	1104	1108	1112	1116	1120	1124	1128	1132	1136	1140	1144	1148	1152	1156	1160	1164	1168	1172	1176	1180	1184	1188	1192	1196
Mlat	645	647	650	652	654	656	659	661	663	665	668	670	672	674	677	679	681	684	686	688	690	692	695	697	699
S_1	***^	***^	***^	***^	***^	***^	***^	***^	***^	***^	***^	***^	***^	***^	***^	***^	***^	***^	***^	***^	***^	***^	***^	***^	172^
S_2	88^	79^	97^	183^	286^	371^	286^	0^	95^	27^	115^	69^	291^	27^	25^	109^	71^	27^	71^	170^	303^	25^	25^	37^	14^
S_3	60^	62^	51^	140^	235^	312^	242^	0^	58^	20^	105^	67^	215^	29^	17^	98^	52^	28^	66^	134^	230^	16^	23^	36^	9^
S_4	229^	249^	169^	363^	505^	605^	531^	***^	184^	55^	167^	106^	333^	60^	47^	149^	122^	56^	116^	233^	352^	54^	52^	68^	36^
S_5	1115^	119^	101^	241^	384^	500^	394^	0^	107^	33^	162^	102^	345^	44^	29^	153^	89^	42^	103^	216^	369^	29^	36^	55^	18^
LOGIC	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3

Table 2. Boundary Analysis sheets for Orbit 9 - continued

MORNING SECTOR BOUNDARY ANALYSIS FOR QUARTER ORBIT FROM UT = 50673 LAT INTERVAL = 14 874 Q1																									
AT T = 1204 (LAT(I),I=1,5) = 524 560 560 532 560																									
n_1	0	6	5	4	5	2	8	2	0	3	6	3	4	2	2	4	2	7	3	2	2	0	7	0	2
n_2	5	4	4	6	7	4	1	1	1	2	6	4	5	1	5	2	2	8	7	0	8	0	3	3	5
n_3	6	10	7	3	5	12	4	4	6	4	6	4	7	4	5	6	8	5	7	8	13	6	6	6	2
n_4	8	6	10	13	7	7	13	5	12	9	6	7	6	8	7	9	11	5	12	3	7	6	6	8	9
n_5	16	21	11	24	34	14	24	17	17	10	11	8	18	16	9	18	10	7	21	19	15	17	13	13	11
n_6	24	20	26	32	130	20	34	24	14	24	14	24	38	24	36	16	16	26	28	22	24	24	18	20	28
n_7	43	47	46	86	807	50	85	36	40	49	44	49	56	63	45	43	38	46	61	77	70	83	52	42	157
n_8	47	62	91	339	6638	63	92	61	77	71	83	66	75	76	92	52	70	92	105	97	133	142	79	34	363
n_9	56	58	232	773	1984	76	120	40	55	84	58	64	71	60	64	53	71	86	104	91	123	237	78	31	837
Del T	1200	1204	1208	1212	1216	1220	1224	1228	1232	1236	1240	1244	1248	1252	1256	1260	1264	1268	1272	1276	1280	1284	1288	1292	1296
Mlat	701	703	706	708	710	712	714	717	719	721	723	725	728	730	732	734	736	739	741	743	745	747	750	752	754
S_1	170^	187^	395^	***^	***^	209^	331^	161^	186^	228^	199^	203^	240^	223^	237^	164^	195^	250^	298^	287^	350^	486^	227^	127^	***^
S_2	21^	12^	7^	17^	19^	17^	18^	17^	27^	10^	3^	6^	11^	17^	10^	14^	16^	3^	15^	22^	17^	27^	8^	20^	12^
S_3	14^	19^	6^	20^	30^	11^	20^	20^	15^	9^	8^	6^	17^	16^	6^	16^	8^	4^	15^	22^	11^	18^	12^	12^	11^
S_4	38^	32^	26^	44^	45^	32^	46^	40^	51^	32^	12^	20^	30^	42^	22^	40^	37^	7^	40^	42^	25^	47^	20^	39^	29^
S_5	23^	24^	12^	30^	40^	19^	31^	28^	29^	16^	9^	10^	21^	26^	11^	24^	18^	5^	23^	32^	18^	31^	15^	21^	18^
LOGIC	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
AT T = 1300 (LAT(I),I=1,5) = 524 560 560 532 560																									
n_1	4	1	3	2	1	4	1	2	0	5	3	5	1	2	0	3	4	1	0	3	3	1	0	1	2
n_2	1	4	2	1	1	4	4	1	0	0	7	3	6	4	2	3	5	4	2	3	0	7	3	2	2
n_3	9	4	3	1	3	4	4	3	2	7	5	2	7	3	0	7	14	6	5	4	3	6	3	5	6
n_4	13	9	9	8	7	16	10	5	11	8	5	13	13	8	4	6	9	8	8	9	8	11	8	9	6
n_5	12	10	14	13	11	19	10	10	20	16	14	16	8	17	18	7	18	24	12	13	8	18	18	14	18
n_6	46	40	44	20	22	24	28	18	44	28	26	22	16	26	20	26	34	24	20	12	26	22	20	12	28
n_7	159	73	65	56	57	61	60	59	57	56	48	56	53	48	42	53	57	74	48	53	60	55	53	39	53
n_8	418	111	110	101	85	99	106	97	80	99	88	97	96	84	71	88	69	101	93	70	89	81	76	57	92
n_9	1308	132	101	85	92	78	97	88	72	80	77	81	74	74	81	69	98	72	87	92	98	80	82	69	99
Del T	1300	1304	1308	1312	1316	1320	1324	1328	1332	1336	1340	1344	1348	1352	1356	1360	1364	1368	1372	1376	1380	1384	1388	1392	1396
Mlat	756	758	761	763	765	767	769	772	774	776	778	780	783	785	787	789	791	794	796	798	800	802	805	807	809
S_1	***^	356^	320^	262^	256^	262^	291^	262^	253^	263^	239^	256^	239^	232^	214^	236^	258^	271^	248^	227^	273^	238^	231^	177^	272^
S_2	16^	14^	13^	16^	16^	16^	15^	11^	33^	15^	10^	14^	17^	15^	28^	8^	15^	22^	20^	11^	13^	19^	23^	18^	17^
S_3	9^	9^	14^	15^	12^	15^	9^	12^	20^	15^	14^	15^	9^	17^	24^	4^	12^	22^	11^	12^	9^	14^	18^	13^	18^
S_4	40^	32^	37^	39^	37^	45^	33^	30^	55^	38^	20^	38^	30^	38^	42^	19^	34^	47^	40^	34^	32^	38^	45^	41^	40^
S_5	20^	17^	22^	25^	21^	26^	18^	18^	36^	23^	17^	24^	17^	25^	36^	9^	20^	33^	22^	19^	17^	23^	30^	23^	27^
LOGIC	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3

Table 2. Boundary Analysis sheets for Orbit 9 - continued

MORNING SECTOR BOUNDARY ANALYSIS FOR QUARTER ORBIT FROM UT = 50673 LAT INTERVAL = 14 874 Q1																									
AT T = 1400 (LAT(I),I=1,5) = 524 560 560 532 560																									
n_1	1	0	1	2	2	2	2	4	1	4	3	2	3	2	0	1	2	1	2	5	4	0	1	0	3
n_2	0	8	1	5	3	2	1	2	5	5	2	3	5	2	2	4	4	5	5	7	1	6	3	6	4
n_3	7	4	7	6	5	2	10	8	7	3	5	5	3	7	4	4	5	2	5	3	4	4	4	5	6
n_4	8	3	10	8	10	9	10	2	9	6	10	8	5	7	13	11	12	7	7	7	4	13	7	5	10
n_5	15	8	13	7	12	11	16	10	13	13	18	18	19	12	16	14	19	16	11	9	11	13	18	18	17
n_6	36	26	22	28	20	26	26	40	16	26	30	30	14	18	28	22	34	12	24	32	22	32	38	48	34
n_7	64	65	60	46	61	54	57	56	66	59	64	74	69	69	66	62	63	66	56	49	58	42	71	56	45
n_8	111	79	105	93	83	73	73	87	84	129	107	120	118	119	119	100	122	109	100	120	98	140	118	109	120
n_9	93	69	66	83	82	77	67	91	89	140	170	144	157	135	129	138	128	117	116	101	114	127	123	126	141
Del T	1400	1404	1408	1412	1416	1420	1424	1428	1432	1436	1440	1444	1448	1452	1456	1460	1464	1468	1472	1476	1480	1484	1488	1492	1496
Mlat	811	813	816	818	820	822	824	827	829	831	833	835	838	840	842	844	846	849	850	852	854	856	858	860	862
S_1	304^	239^	253^	250^	246^	230^	223^	274^	255^	354^	371^	368^	358^	341^	342^	322^	347^	304^	296^	302^	292^	341^	350^	339^	340^
S_2	22^	19^	20^	10^	13^	13^	20^	10^	16^	8^	16^	16^	14^	13^	26^	17^	18^	17^	10^	6^	10^	22^	19^	22^	13^
S_3	14^	10^	11^	4^	10^	12^	13^	13^	9^	13^	16^	17^	21^	10^	15^	12^	15^	17^	9^	7^	13^	11^	18^	19^	14^
S_4	45^	9^	43^	20^	36^	35^	45^	17^	34^	22^	43^	41^	32^	34^	50^	40^	44^	35^	25^	10^	25^	39^	42^	35^	38^
S_5	26^	17^	22^	10^	18^	20^	24^	17^	18^	17^	25^	26^	27^	18^	28^	22^	26^	25^	14^	9^	18^	23^	28^	27^	21^
LOGIC	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**
AT T = 1504 (LAT(I),I=1,5) = 524 560 560 532 560																									
n_1	0	1	4	2	4	3	4	0	0	4	0	2	1	1	1	1	1	0	2	2	1	2	0	2	4
n_2	3	5	2	2	1	1	3	1	2	5	2	5	2	5	3	2	1	4	7	3	2	4	4	2	4
n_3	3	5	7	4	4	4	4	6	2	9	3	3	6	3	3	5	2	2	2	5	3	2	3	2	8
n_4	10	9	19	6	7	3	3	9	10	7	8	4	19	5	8	6	5	5	16	8	5	7	13	6	13
n_5	15	18	21	26	11	19	13	11	15	12	17	11	14	11	17	14	14	17	20	6	11	22	19	14	15
n_6	24	16	28	18	36	26	32	40	28	28	38	40	24	36	10	26	24	34	26	24	24	24	28	28	32
n_7	79	62	71	68	54	49	50	36	54	68	49	59	56	58	58	60	70	57	72	64	51	46	50	36	57
n_8	113	111	108	111	85	104	85	74	89	74	81	88	78	96	108	90	83	78	79	76	92	85	74	90	109
n_9	125	121	116	99	126	127	105	65	60	68	66	70	68	58	82	65	65	67	64	64	67	62	56	82	97
Del T	90	119	97	90	103	98	88	27	41	31	30	51	34	43	39	51	47	42	41	35	50	44	27	38	67
Mlat	1500	1504	1508	1512	1516	1520	1524	1528	1532	1536	1540	1544	1548	1552	1556	1560	1564	1568	1572	1576	1580	1584	1588	1592	1596
S_1	863	865	867	869	871	873	875	877	877	877	877	877	878	878	878	878	878	879	879	879	879	879	880	878	876
S_2	341^	310^	323^	296^	301^	306^	272^	215^	231^	238^	234^	257^	226^	248^	258^	241^	242^	236^	241^	228^	234^	217^	208^	236^	295^
S_3	22^	18^	21^	23^	10^	17^	8^	22^	24^	8^	24^	10^	26^	13^	19^	16^	18^	22^	21^	9^	13^	19^	26^	14^	12^
S_4	15^	16^	15^	27^	11^	23^	16^	10^	16^	8^	18^	13^	14^	12^	17^	15^	18^	20^	17^	6^	13^	23^	17^	16^	10^
S_5	44^	40^	53^	49^	30^	38^	22^	42^	46^	22^	46^	20^	52^	25^	42^	38^	39^	38^	45^	24^	32^	42^	49^	35^	37^
S5	26^	25^	29^	39^	17^	32^	19^	22^	28^	12^	30^	16^	29^	17^	27^	23^	27^	30^	29^	11^	20^	33^	30^	24^	18^
LOGIC	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**
EXITING SEARCJ WITH ITIM = 52277 53729 872 11																									
NORB = 9 364 4 52277																									

Table 2. Boundary Analysis sheets for Orbit 9 - continued

EVENING SECTOR BOUNDARY ANALYSIS FOR QUARTER ORBIT FROM UT = 52277 LAT INTERVAL = 872 11 Q2

AT T = 896 (LAT(I),I=1,5) = -999 -999 -999 -999 -999

n_1	1	5	0	2	3	2	0	3	0	2	1	0	1	2	2	2	1	2	1	3	1	3	4	0	3
n_2	1	2	6	0	1	2	3	3	1	2	2	3	0	1	1	1	0	5	4	0	1	1	5	1	0
n_3	1	0	1	2	0	1	1	0	3	3	4	1	1	1	0	1	2	1	1	3	4	1	2	2	2
n_4	1	1	1	0	1	1	1	0	0	1	2	0	0	2	4	1	2	2	1	0	2	0	3	5	3
n_5	1	0	1	1	3	2	2	0	3	5	1	4	0	2	0	3	0	1	1	1	0	0	0	0	1
n_6	0	0	2	0	6	0	4	2	0	0	0	0	2	0	2	6	4	0	2	2	2	0	8	2	4
n_7	3	2	6	2	1	4	3	2	5	4	5	1	1	4	2	10	4	7	1	5	3	4	4	3	8
n_8	9	11	10	3	13	8	4	7	10	8	10	8	8	11	6	9	8	9	10	13	6	15	7	10	13
n_9	8	16	12	18	18	16	15	16	11	17	18	21	12	12	9	21	14	19	13	17	12	24	17	16	19
Del T	896	892	888	884	880	876	872	868	864	860	856	852	848	844	840	836	832	828	824	820	816	812	808	804	800
Mlat	383	385	387	390	392	394	396	398	400	403	405	407	409	411	414	416	418	420	423	425	427	429	431	433	435
S_1	20	29	30	23	38	28	26	27	26	29	33	30	23	27	19	46	30	35	26	37	23	43	36	31	44
S_2	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	8	0	0	0	0	5	0	0
S_3	0	0	0	0	0	0	0	0	0	9	0	0	0	0	0	0	0	8	0	0	0	0	13	0	0
S_4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
S_5	0	0	0	0	0	0	0	0	0	9	0	0	0	0	0	0	0	11	0	0	0	0	11	0	0
LOGIC	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

AT T = 796 (LAT(I),I=1,5) = -999 -999 -999 -999 -999

n_1	1	1	0	1	5	4	3	0	1	2	1	2	2	4	3	3	3	5	4	4	4	2	4	3	3
n_2	1	2	3	2	4	3	5	1	4	1	3	3	2	3	0	1	2	3	5	4	8	3	5	3	4
n_3	0	0	2	3	1	1	2	5	0	2	0	2	1	0	2	3	1	2	4	5	2	2	5	2	4
n_4	2	1	0	2	2	2	1	1	2	3	4	4	0	3	4	1	4	2	3	4	4	7	1	0	0
n_5	1	0	1	1	2	2	4	1	3	0	4	1	0	1	2	1	3	2	1	2	1	2	2	1	2
n_6	0	2	2	2	0	8	0	4	2	0	2	6	10	2	0	0	2	4	4	4	0	2	2	4	2
n_7	3	3	9	5	7	1	6	6	6	6	4	4	3	3	2	4	3	3	4	4	6	8	3	3	8
n_8	5	7	9	11	11	7	14	9	7	11	6	7	12	8	7	12	12	7	12	10	11	4	8	3	13
n_9	15	15	14	17	19	16	17	18	23	12	20	21	12	16	18	20	16	17	7	18	23	31	17	17	19
Del T	796	792	788	784	780	776	772	768	764	760	756	752	748	744	740	736	732	728	724	720	716	712	708	704	700
Mlat	437	440	442	444	446	448	450	452	455	457	459	461	463	465	468	470	472	474	476	479	481	483	485	488	490
S_1	23	27	34	35	37	32	37	37	38	29	32	38	37	29	27	36	33	31	27	36	40	45	30	27	42
S_2	0	0	0	0	7	5	6	0	0	0	9	4	0	7	9	0	4	6	3	2	9	7	5	0	5
S_3	0	0	0	0	5	4	8	0	0	0	7	8	0	9	6	0	5	3	9	6	12	11	9	0	9
S_4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20	0	0	0	0
S_5	0	0	0	0	10	7	9	0	0	0	12	7	0	11	10	0	7	8	8	5	14	12	10	0	10
LOGIC	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Table 2. Boundary Analysis sheets for Orbit 9 - continued

EVENING SECTOR BOUNDARY ANALYSIS FOR QUARTER ORBIT FROM UT = 52277 LAT INTERVAL = 872 11 Q2																									
AT T = 696 (LAT(I),I=1,5) = -999 -999 -999 -999 -999																									
n_1	1	3	4	3	3	4	2	2	1	6	3	7	3	0	0	4	3	5	3	9	7	14	13	6	13
n_2	3	0	4	3	1	1	8	12	13	9	20	28	6	7	5	9	6	8	11	7	9	9	14	11	19
n_3	3	1	2	2	3	5	2	8	14	16	31	16	12	20	7	5	7	4	9	8	14	17	16	13	18
n_4	3	0	4	3	2	3	6	7	8	5	7	6	4	6	7	13	5	3	6	19	18	11	20	19	19
n_5	3	2	1	0	2	1	9	6	6	5	7	2	2	1	1	4	2	10	2	12	9	17	15	11	12
n_6	0	2	0	4	8	2	10	0	6	6	2	2	6	4	6	4	12	6	4	12	6	12	18	24	6
n_7	4	8	6	10	6	6	12	18	16	15	7	15	10	8	8	10	3	11	9	15	14	18	21	20	20
n_8	9	8	13	5	9	10	14	12	21	9	14	14	16	12	13	14	12	16	15	22	19	24	24	30	20
n_9	20	22	18	22	23	16	27	34	29	25	28	22	26	16	25	20	28	21	34	26	19	32	32	32	31
Del T	696	692	688	684	680	676	672	668	664	660	656	652	648	644	640	636	632	628	624	620	616	612	608	604	600
Mlat	492	494	497	499	501	503	506	508	510	512	515	517	519	522	524	526	528	530	532	535	537	539	541	543	546
S_1	33	40	37	41	46	34	63	64	72	55	51	53	58	40	52	48	55	54	62	75	58	86	95	106	77
S_2	7	0	4	3	5	8	13	17	23	11	30+	25	13	30+	18	11	7	7	14	9	10	7	4	12	7
S_3	2	0	9	12	3	9	9	6	11	14	25+	27*	16	27+	15	14	9	11	14	11	11	7	5	10	8
S_4	0	0	0	0	0	0	12	2	0	12	18	45+	0	0	0	9	0	0	16	26+	21	9	13	23	1
S_5	5	0	8	8	5	11	15	14	19	17	34	33	18	33	17	16	10	12	16	16	14	10	7	14	9
LOGIC	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
																Avg 1	*Avg 2*	*<<<<< No further Avg calc required*							
AT T = 596 (LAT(I),I=1,5) = **570 572 585 568 572**										<<<	Mlats for start of averaging					57.3	57.1	{ << 58.5 removed }				**Boundary Mlat = 57.0**			
n_1	22	18	23	20	25	27	24	22	19	13	16	13	8	8	15	15	11	7	10	9	12	6	20	6	58
n_2	16	28	24	27	33	26	31	23	22	14	17	16	27	36	26	54	32	51	70	74	56	39	34	19	45
n_3	17	31	35	30	30	27	32	25	27	38	28	76	74	83	70	97	79	105	107	135	110	94	105	87	111
n_4	18	29	30	26	35	30	26	36	27	39	58	95	59	62	77	84	73	123	145	129	105	114	137	100	112
n_5	16	28	32	38	35	46	36	22	33	32	38	62	68	59	56	82	64	113	129	165	174	165	148	96	74
n_6	26	26	54	64	30	36	48	36	48	24	52	78	96	92	100	160	156	138	290	476	308	316	224	186	92
n_7	27	37	43	53	55	37	47	50	45	81	70	105	123	144	207	257	268	310	394	406	392	424	286	201	149
n_8	35	49	50	42	88	59	53	43	63	102	119	115	102	173	214	268	283	330	334	321	325	254	249	240	213
n_9	60	63	55	80	75	70	65	71	104	119	165	160	163	248	286	352	358	270	286	255	346	354	372	499	332
Del T	596	592	588	584	580	576	572	568	564	560	556	552	548	544	540	536	532	528	524	520	516	512	508	504	500
Mlat	548	550	552	555	557	559	561	563	565	568	570	572	574	576	579	581	583	585	588	590	592	594	596	598	601
S_1	148	175	202	239	248	202	213	200	260	326	406+	458*	484^	657^	807^	***^	***^	***^	***^	***^	***^	***^	***^	***^	786^
S_2	6	11	8	9	7	6	7	7	7	23	23	51+	47*	48^	40^	47^	45^	64^	64^	70^	63^	69^	60^	64^	28^
S_3	3	4	5	10	4	14	7	11	7	12	19	26+	18	18	19	16	17	23+	25*	29^	38^	38^	31^	25^	23^
S_4	6	14	19	21	14	26+	8	17	24	52+	64*	102^	81^	70^	79^	75^	80^	115^	117^	123^	126^	140^	136^	122^	60^
S_5	6	10	10	13	8	16	9	13	11	27	34	56+	46*	45^	43^	44^	45^	61^	62^	68^	71^	76^	69^	64^	38^
LOGIC	**0**	**0**	-1	-1	-1	-1	-1	-1	-1	-1	-1	1	1	1	1	1	1	1	1	2	2	2	2	2	2

Time of Boundary is time of start of successful 12-sec interval for Q1 TRUE = 52833 secs (52277 + 556)

Table 2. Boundary Analysis sheets for Orbit 9 - continued

EVENING SECTOR BOUNDARY ANALYSIS FOR QUARTER ORBIT FROM UT = 52277 LAT INTERVAL = 872 11 Q2																									
AT T = 496 (LAT(I),I=1,5) = 570 572 585 568 572																									
n_1	462	268	356	245	142	190	105	99	107	99	65	52	52	47	47	96	113	110	113	93	135	151	88	49	111
n_2	420	256	398	262	163	179	153	182	179	127	112	355	551	864	894	566	752	796	678	374	676	488	498	495	1354
n_3	488	298	398	362	274	602	1044	1396	812	866	1036	1592	1812	1996	2712	1120	1332	1392	1516	940	1002	670	3408	1752	4264
n_4	518	353	430	480	495	1108	2296	3720	3424	2832	3096	3256	3584	2560	3200	1668	1272	1892	2912	2452	1370	1088	****	4976	7544
n_5	476	290	382	658	716	1948	3904	4344	4536	4216	3896	3672	4056	2636	2532	1996	1280	2840	4112	2992	1556	1308	****	5168	2680
n_6	544	330	488	1360	1476	6264	6552	5144	5976	5784	4504	4792	4680	3096	2760	3048	2152	4808	7800	3544	1720	1920	8248	3976	964
n_7	500	342	650	2404	2512	****	7192	3928	4408	4192	3240	3608	4000	2456	2062	2920	2344	4020	7384	2432	1210	2168	4976	4272	600
n_8	574	436	1554	5072	5896	****	4028	1988	2128	2148	1736	1576	2812	1328	1112	1574	1592	1168	3184	1700	842	1894	3032	2208	357
n_9	618	774	7276	****	****	****	4140	984	1536	1332	1144	890	3206	890	603	922	910	864	1980	857	456	1541	2076	1340	432
Del T	496	492	488	484	480	476	472	468	464	460	456	452	448	444	440	436	432	428	424	420	416	412	408	404	400
Mlat	603	605	607	609	612	614	616	618	621	623	625	627	629	631	634	636	638	640	642	645	647	649	651	654	656
S_1	***^	***^	***^	***^	***^	***^	***^	***^	***^	***^	***^	***^	***^	***^	***^	***^	***^	***^	***^	***^	***^	***^	***^	***^	***^
S_2	12^	14^	12^	54^	90^	204^	381^	450^	455^	425^	433^	401^	408^	322^	370^	240^	208^	270^	356^	328^	194^	157^	46^	500^	0^
S_3	11^	17^	10^	61^	85^	170^	253^	244^	0^	267^	241^	204^	208^	128^	139^	123^	69^	163^	221^	195^	92^	95^	22^	0^	124^
S_4	35^	46^	20^	187^	260^	486^	754^	866^	860^	812^	815^	783^	805^	594^	632^	495^	333^	556^	743^	674^	390^	358^	***^	953^	866^
S_5	18^	24^	15^	95^	144^	292^	464^	502^	534^	505^	485^	434^	443^	313^	345^	263^	190^	310^	424^	388^	205^	190^	***^	547^	570^
LOGIC	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
AT T = 396 (LAT(I),I=1,5) = 570 572 585 568 572																									
n_1	79	100	383	872	1148	1502	562	257	423	812	1208	1326	1940	522	422	422	254	207	96	111	137	138	63	69	42
n_2	2198	1426	3920	5200	6232	7688	3028	1640	1536	2832	4680	4280	6168	1980	1288	1340	1256	1008	758	778	808	750	551	397	195
n_3	6616	3688	6856	5528	5864	8104	3864	1896	2480	5704	****	7208	****	2992	1892	2184	2520	1724	1672	1892	1860	1704	1716	1224	616
n_4	5304	3712	3668	2556	1932	2648	1388	1208	2556	****	****	7272	****	3176	1428	2036	3200	1684	2008	2156	2184	2196	2088	1496	1176
n_5	1492	1412	820	576	438	610	378	468	1998	8872	4936	3184	6744	1588	666	1200	2608	1038	1372	1564	1804	2268	1992	900	1012
n_6	1440	664	644	436	364	492	326	262	3132	****	4360	4312	4600	1512	704	1980	3352	908	1352	2584	2016	3864	3688	1552	1488
n_7	986	528	592	376	347	357	231	224	1871	8288	3216	3612	3532	1136	672	1258	3512	1034	1122	1896	2012	7072	8760	7096	3424
n_8	496	496	501	283	254	344	279	216	1358	3656	1426	1596	3084	889	503	1468	3384	1742	1354	1880	2452	6872	9896	****	4992
n_9	426	339	582	402	190	334	250	350	1008	2736	1134	1568	3080	727	562	3226	1750	3730	1236	2504	3568	7336	****	****	5640
Del T	396	392	388	384	380	376	372	368	364	360	356	352	348	344	340	336	332	328	324	320	316	312	308	304	300
Mlat	658	660	662	664	667	669	671	673	675	678	680	682	684	687	689	691	693	696	698	700	702	705	707	709	711
S_1	***^	***^	***^	***^	***^	***^	***^	***^	***^	***^	***^	***^	***^	***^	***^	***^	***^	***^	***^	***^	***^	***^	***^	***^	***^
S_2	1218^	395^	202^	41^	207^	106^	327^	235^	243^	221^	0^	153^	97^	267^	182^	211^	304^	218^	260^	275^	269^	271^	294^	233^	209^
S_3	8 43^	246^	49^	0^	0^	0^	344^	180^	94^	54^	0^	0^	128^	168^	144^	119^	122^	105^	109^	110^	103^	116^	114^	109^	100^
S_4	548^	502^	27^	377^	583^	618^	304^	50^	384^	***^	914^	474^	859^	327^	83^	259^	563^	288^	434^	464^	481^	535^	542^	394^	417^
S_5	1544^	389^	525^	481^	545^	616^	400^	241^	229^	668^	763^	423^	659^	267^	196^	209^	300^	205^	247^	261^	259^	278^	286^	228^	223^
LOGIC	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3

Table 2. Boundary Analysis sheets for Orbit 9 - continued

EVENING SECTOR BOUNDARY ANALYSIS FOR QUARTER ORBIT FROM UT = 52277 LAT INTERVAL = 872 11 Q2																									
AT T = 296 (LAT(I),I=1,5) = 570 572 585 568 572																									
n_1	71	29	77	52	60	45	60	42	71	59	133	217	231	128	69	57	23	7	3	4	1	1	0	1	2
n_2	427	241	497	601	740	350	581	276	504	693	740	908	812	522	413	463	182	20	23	1	0	2	4	3	3
n_3	1030	818	3048	4282	4456	1808	3940	1488	2196	3320	1912	2160	1964	1324	1632	2300	696	63	48	9	3	3	7	16	6
n_4	1356	1440	5096	5824	9896	4360	6840	3316	3704	4952	3400	3864	2516	1688	3204	4360	706	119	76	23	11	10	19	52	17
n_5	1028	1052	2820	4928	7480	4760	7968	5376	3400	2856	2512	2424	1548	1136	2908	5480	493	85	80	37	15	13	22	78	25
n_6	1368	1096	5176	7544	****	7896	****	8840	7032	5400	3360	3384	4012	976	9480	****	350	60	48	50	28	30	36	80	34
n_7	2408	3052	5080	8952	****	9256	****	****	****	7256	5144	5776	7248	3360	****	****	215	28	29	28	31	38	39	34	33
n_8	2280	3960	6240	****	****	8248	****	****	****	****	7784	8776	****	7544	****	****	105	7	23	65	57	82	88	27	44
n_9	3064	3212	4632	****	8284	7200	****	****	****	9240	8296	8400	****	****	****	****	54	20	21	89	61	69	105	51	67
Del T	296	292	288	284	280	276	272	268	264	260	256	252	248	244	240	236	232	228	224	220	216	212	208	204	200
Mlat	714	716	718	721	723	725	727	729	731	734	736	738	740	742	745	747	749	751	754	756	758	760	762	764	766
S_1	***^	***^	***^	***^	***^	***^	***^	***^	***^	***^	***^	***^	***^	***^	***^	***^	724^	115^	121^	232^	177^	219^	268^	192^	178^
S_2	1211^	238^	0^	0^	0^	479^	234^	471^	405^	0^	337^	337^	263^	225^	370^	484^	178^	61^	51^	31^	24^	18^	29^	59^	24^
S_3	8 87^	108^	236^	215^	0^	0^	131^	0^	179^	221^	160^	177^	132^	103^	174^	0^	72^	31^	24^	24^	15^	13^	16^	36^	19^
S_4	386^	445^	825^	973^	***^	913^	***^	898^	774^	798^	655^	651^	473^	409^	720^	939^	287^	123^	104^	71^	49^	41^	57^	110^	57^
S_5	1207^	242^	477^	525^	704^	517^	640^	547^	414^	458^	353^	361^	269^	226^	390^	526^	167^	67^	54^	42^	29^	23^	32^	68^	33^
LOGIC	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
AT T = 196 (LAT(I),I=1,5) = 570 572 585 568 572																									
n_1	4	6	1	1	1	1	4	2	1	1	1	2	2	2	3	1	0	1	0	1	2	0	1	4	1
n_2	5	4	0	1	7	3	2	1	5	5	1	2	0	5	2	1	2	0	3	5	2	3	5	4	4
n_3	4	6	4	4	3	7	1	5	3	6	6	4	1	9	7	3	8	2	3	6	4	5	3	4	2
n_4	8	12	7	7	9	8	11	6	11	8	6	6	12	5	6	5	5	4	5	8	7	13	14	9	10
n_5	5	11	7	12	12	16	17	18	12	11	12	9	18	14	14	10	11	13	9	12	10	16	15	17	11
n_6	22	16	20	30	32	32	24	34	30	28	24	24	32	16	18	26	16	20	18	24	16	22	32	20	32
n_7	39	30	31	38	40	38	28	32	37	33	34	38	40	41	33	24	29	28	40	31	28	39	41	55	47
n_8	50	49	63	47	81	57	46	47	42	42	41	42	60	43	34	43	39	32	38	52	27	41	56	64	68
n_9	54	57	74	70	86	44	28	41	28	38	29	36	45	44	27	44	29	32	42	28	18	28	36	53	74
Del T	196	192	188	184	180	176	172	168	164	160	156	152	148	144	140	136	132	128	124	120	116	112	108	104	100
Mlat	768	771	773	775	777	779	781	783	786	788	790	792	794	796	799	801	803	805	807	810	812	814	816	819	821
S_1	165^	152^	188^	185^	239^	171^	126^	154^	137^	141^	128^	140^	177^	144^	112^	137^	113^	112^	138^	135^	89^	130^	165^	192^	221^
S_2	4^	8^	16^	16^	17^	18^	16^	18^	17^	14^	17^	9^	24^	14^	12^	13^	21^	19^	16^	15^	11^	24^	20^	11^	16^
S_3	6^	8^	8^	13^	11^	14^	17^	19^	11^	8^	12^	9^	19^	13^	13^	12^	11^	18^	10^	9^	10^	14^	13^	15^	11^
S_4	11^	27^	34^	39^	28^	40^	41^	42^	35^	29^	37^	28^	51^	27^	33^	33^	35^	38^	29^	31^	31^	48^	42^	35^	34^
S_5	7^	13^	17^	22^	19^	23^	27^	29^	20^	16^	21^	14^	33^	18^	20^	19^	20^	27^	17^	17^	16^	27^	25^	22^	20^
LOGIC	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3

Table 2. Boundary Analysis sheets for Orbit 9 - continued

EVENING SECTOR BOUNDARY ANALYSIS FOR QUARTER ORBIT FROM UT = 52277 LAT INTERVAL = 872 11 Q2																								
AT T = 96 (LAT(I),I=1,5) = 570 572 585 568 572																								
n_1	2	2	0	2	1	3	3	5	1	0	1	1	0	4	2	0	1	4	1	2	1	2	0	0
n_2	6	5	5	1	3	2	7	2	2	5	4	4	3	1	6	3	3	2	2	2	0	3	2	5
n_3	6	1	5	3	4	4	3	4	2	3	3	1	3	3	3	6	2	2	3	3	7	6	4	4
n_4	6	11	12	12	7	11	11	7	10	9	8	10	8	5	6	7	3	9	16	8	6	9	12	6
n_5	16	8	14	21	19	20	21	13	16	12	17	34	28	16	12	11	15	22	12	10	18	9	27	26
n_6	30	30	22	26	18	26	32	28	38	40	28	32	38	24	30	38	40	44	26	28	28	18	20	28
n_7	38	36	60	46	47	49	51	59	67	51	67	65	62	64	70	58	54	53	48	51	80	41	42	47
n_8	69	82	71	61	71	86	106	86	107	96	130	126	105	121	119	113	88	87	122	109	117	64	67	60
n_9	82	89	87	76	67	88	109	99	108	97	128	134	146	122	128	119	98	98	117	105	136	66	45	55
Del T	96	92	88	84	80	76	72	68	64	60	56	52	48	44	40	36	32	28	24	20	16	12	8	4
Mlat	823	825	827	829	831	833	835	837	839	841	843	845	847	850	852	854	856	858	860	862	864	866	868	870
S_1	219^	237^	240^	209^	203^	249^	298^	272^	320^	284^	353^	357^	351^	331^	347^	328^	280^	282^	313^	293^	361^	189^	174^	190^
S_2	14^	14^	21^	23^	19^	18^	16^	10^	20^	19^	18^	32^	31^	14^	12^	18^	16^	18^	23^	11^	24^	11^	32^	27^
S_3	15^	11^	11^	19^	19^	18^	18^	13^	16^	11^	17^	31^	27^	19^	12^	10^	20^	22^	14^	10^	19^	7^	24^	26^
S_4	29^	27^	41^	52^	43^	46^	38^	29^	45^	34^	40^	58^	55^	34^	23^	35^	32^	44^	47^	32^	46^	30^	59^	47^
S_5	21^	19^	23^	33^	29^	29^	27^	18^	28^	21^	26^	48^	42^	26^	17^	19^	28^	32^	28^	17^	30^	14^	40^	38^
LOGIC	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**
EXITING SEARCH WITH ITIM = 53733 55273 14 850																								

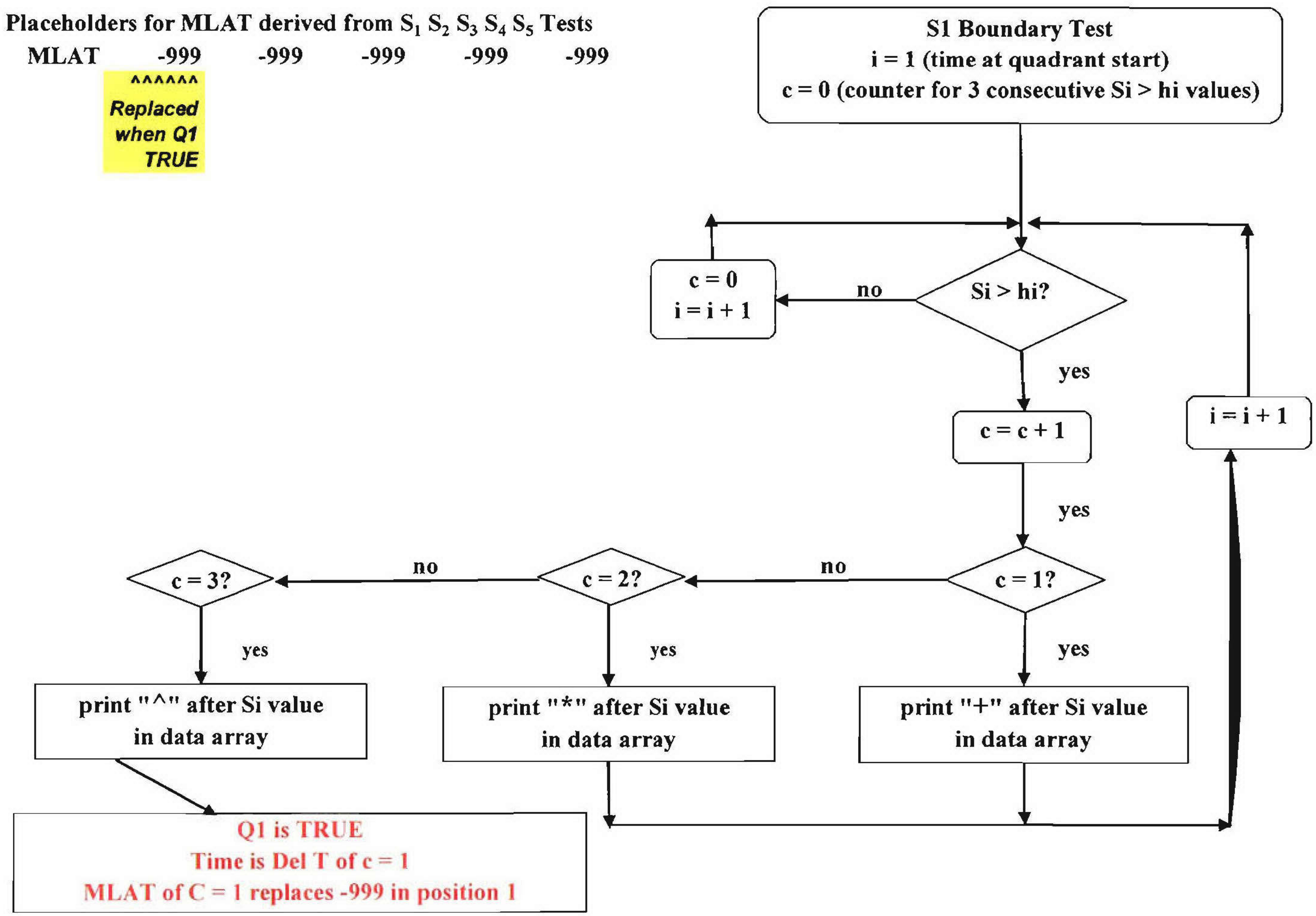

Figure 2

Flow Chart for S_1 Boundary Test

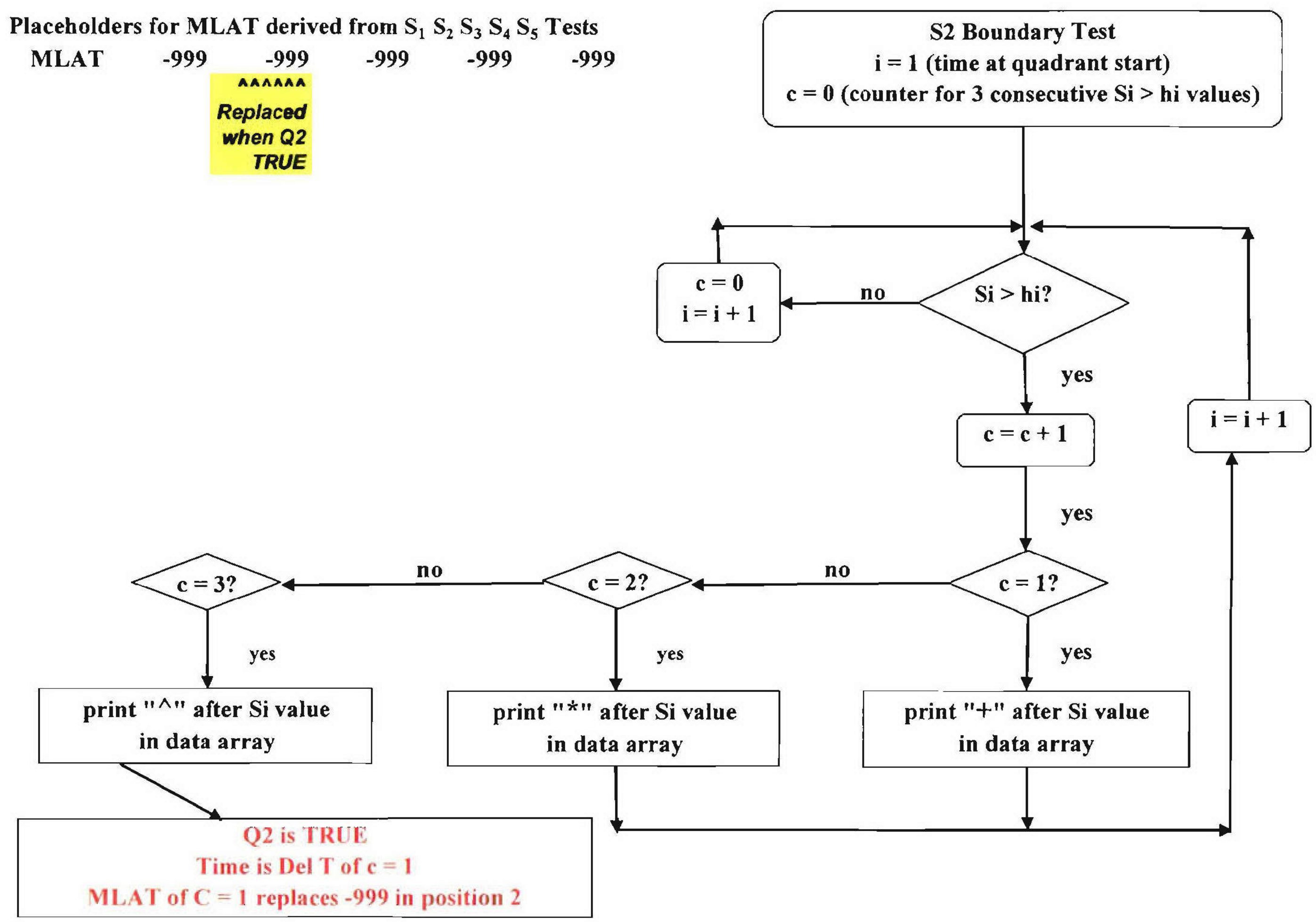

Figure 3

Flow Chart for S_2 Boundary Test

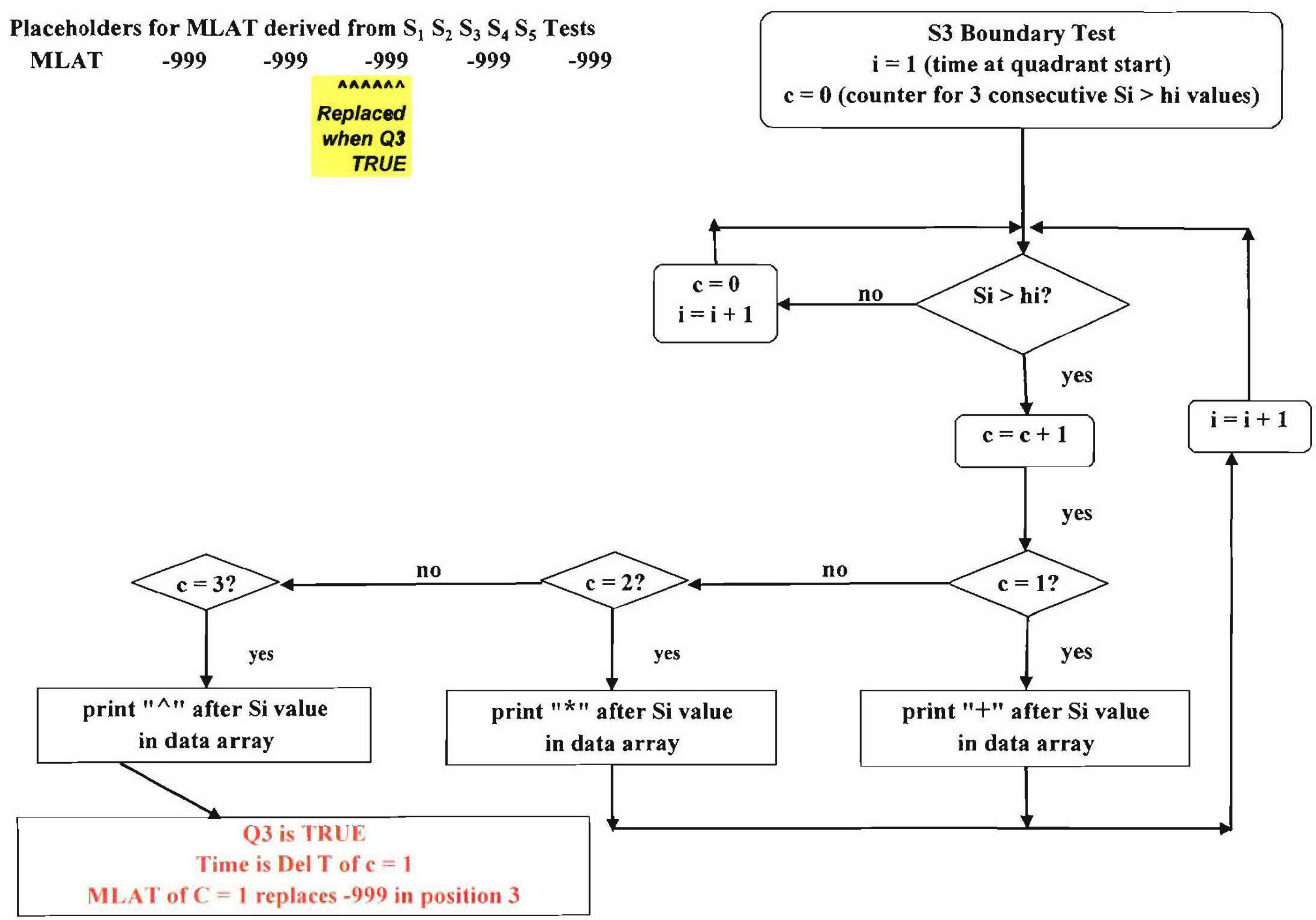

Figure 4

Flow Chart for S_3 Boundary Test

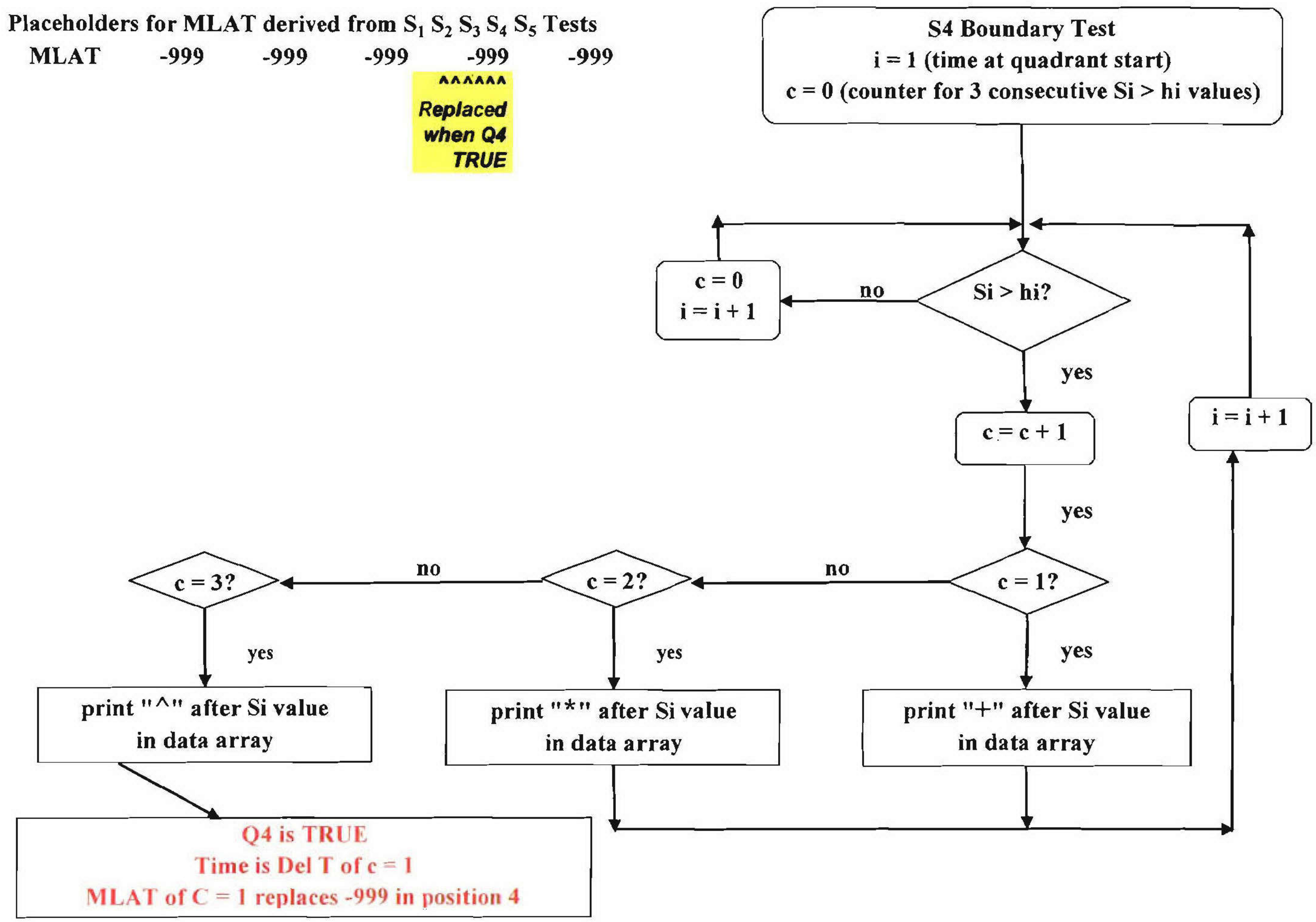

Figure 5

Flow Chart for S_4 Boundary Test

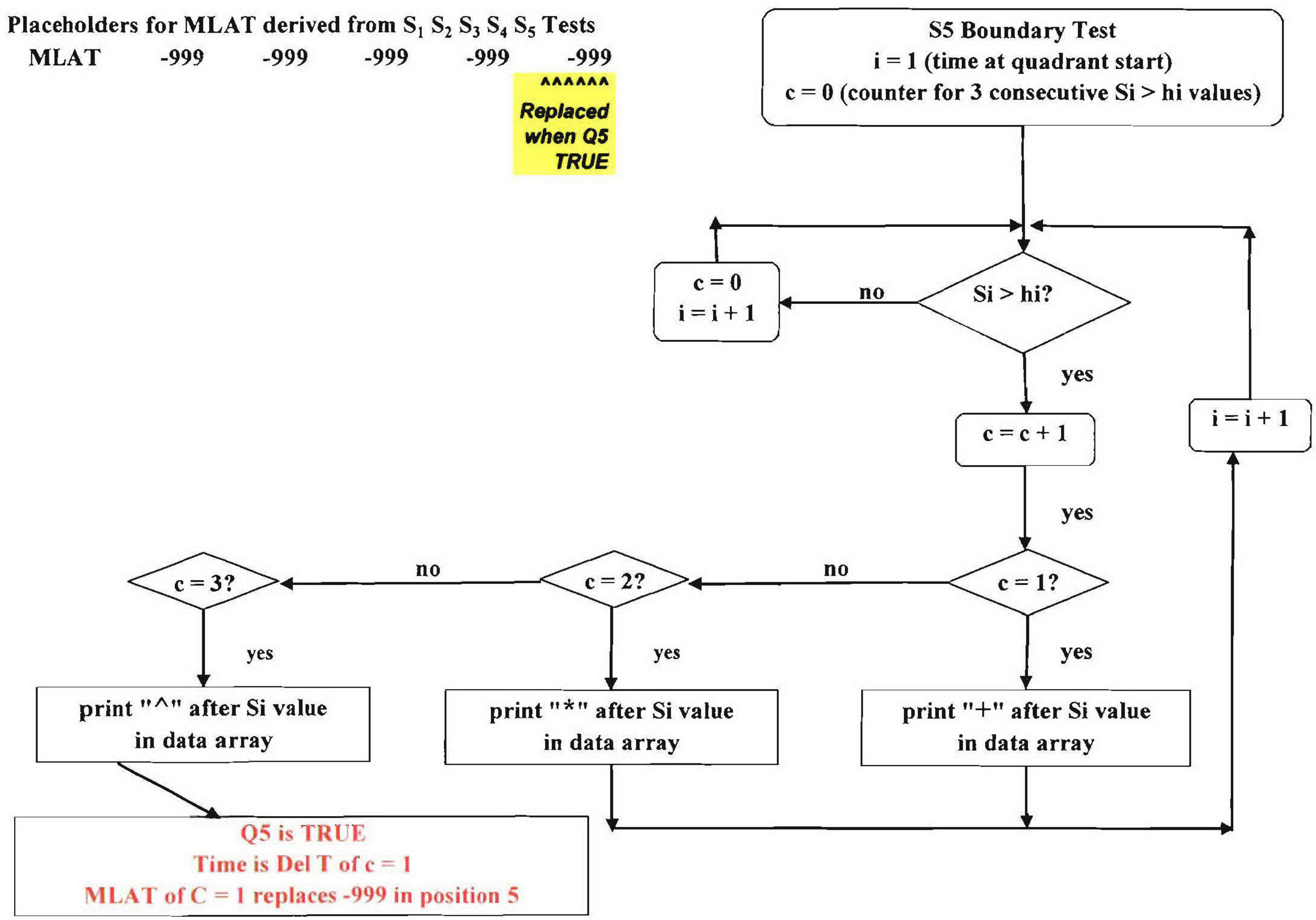

Figure 6

Flow Chart for S_5 Boundary Test

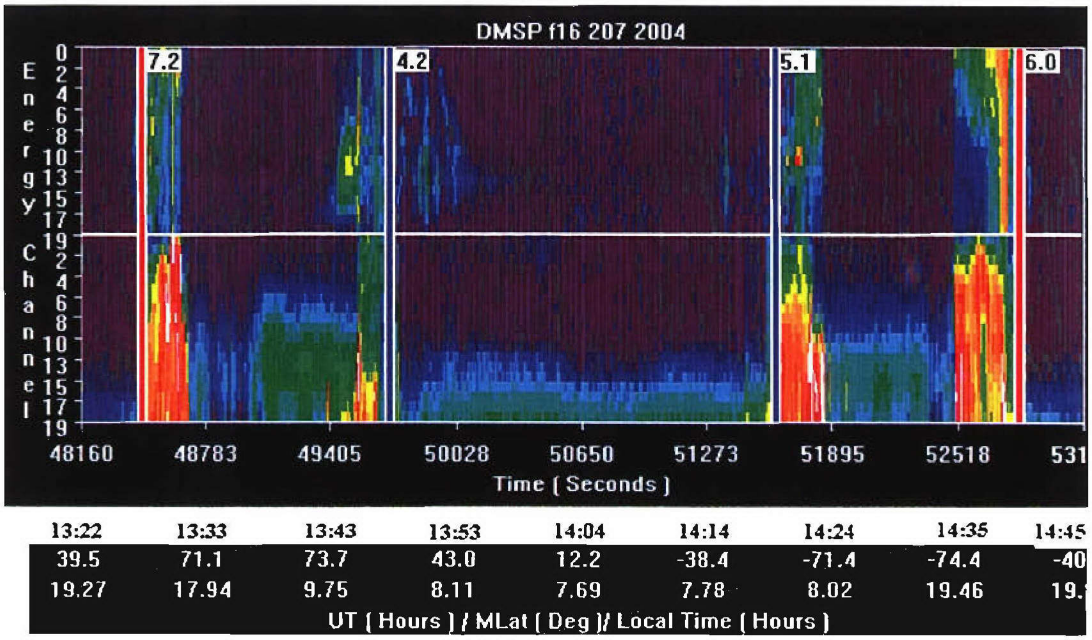

Figure 7

Compressed Time View – All 4 Boundaries

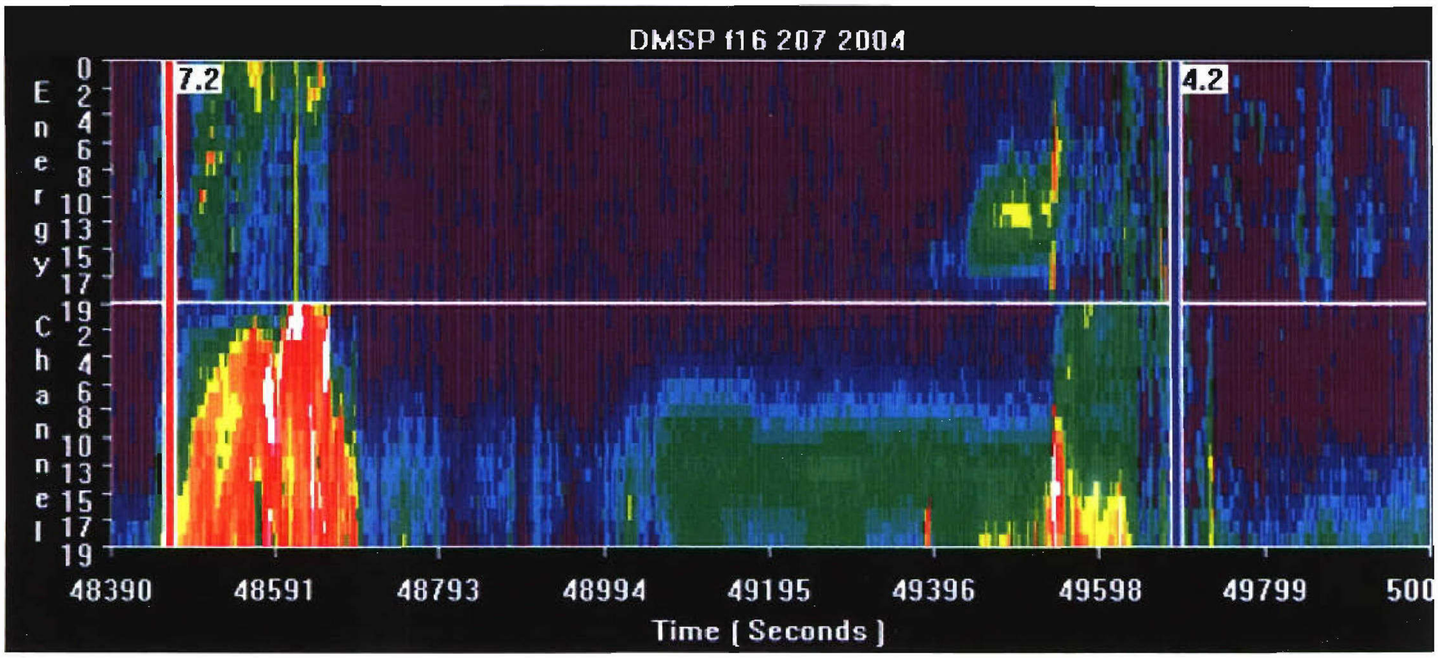

Figure 7a

Expanded Time View – Quad 1 and Quad 2 Boundaries

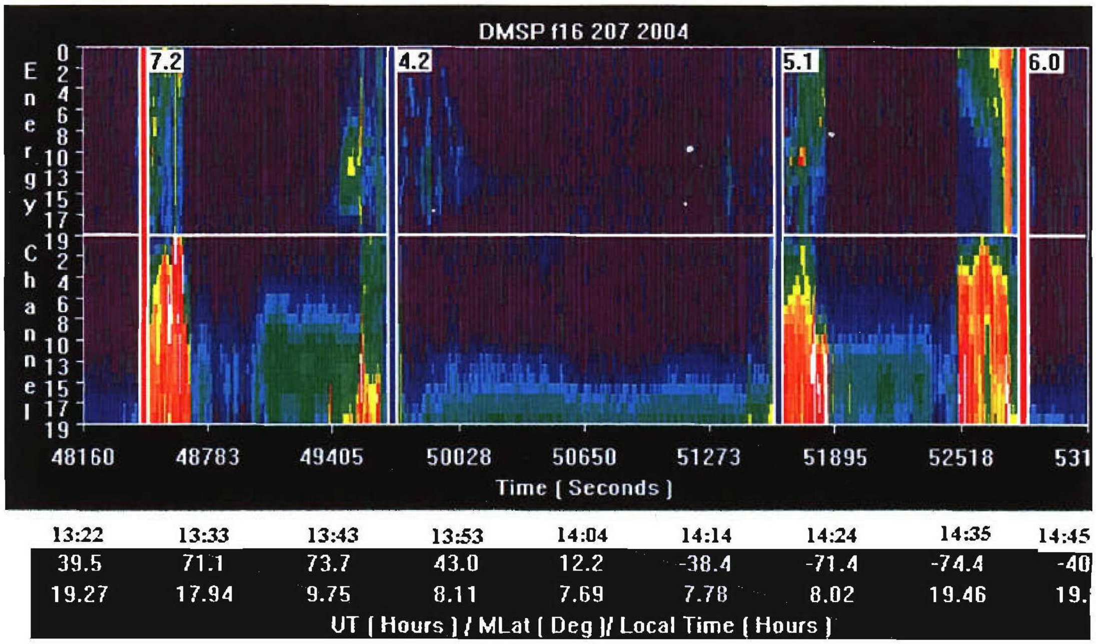

Figure 7

Compressed Time View – All 4 Boundaries

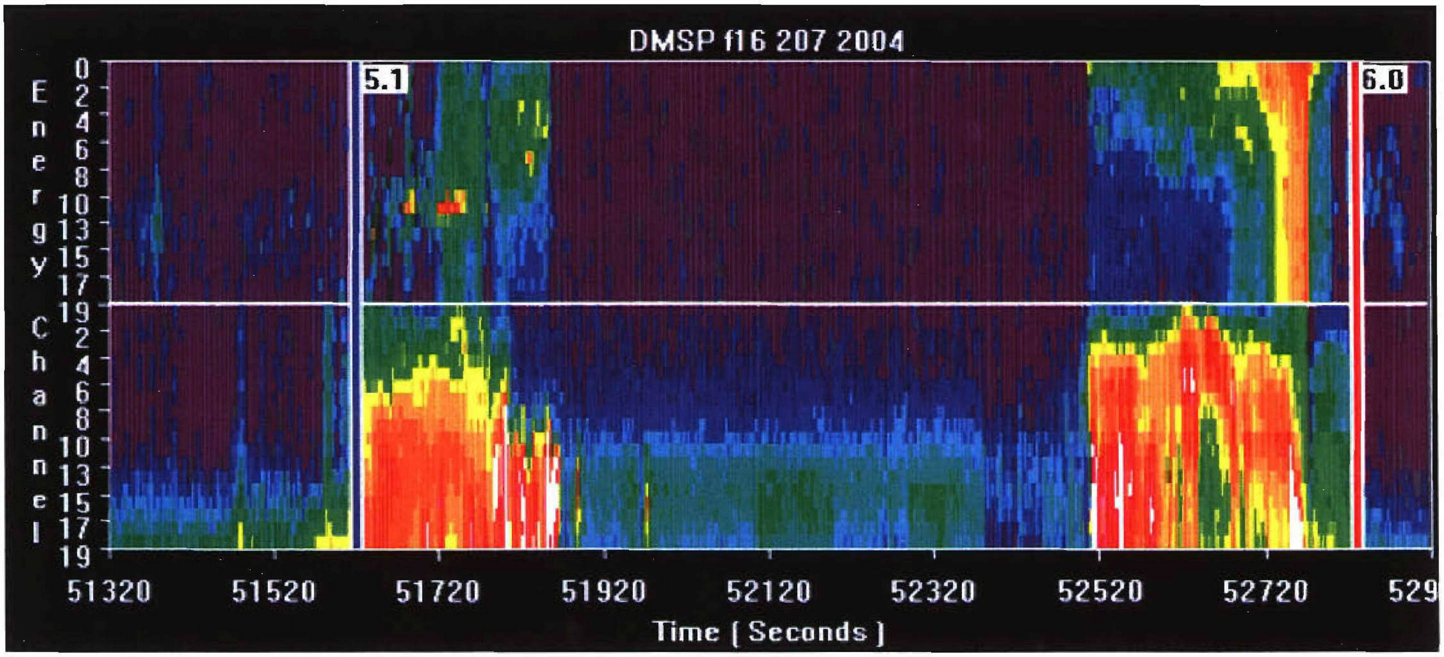

Figure 7b

Expanded Time View – Quad 3 and Quad 4 Boundaries

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Gussenhoven, M. S., D. A. Hardy, and W. J. Burke, Comment on "Diurnal variation of the auroral oval size", by C. -I. Meng, *J. Geophys. Res.*, **85**, 2373, 1980.

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